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# AUSTRALIAN

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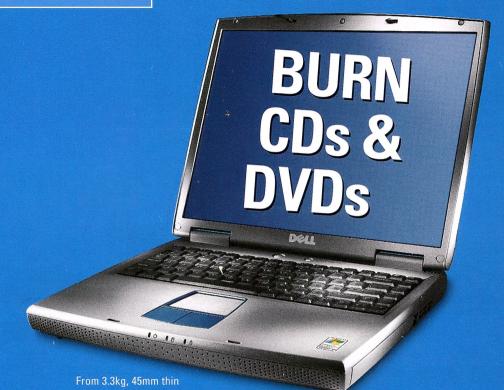


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SERIES NOTEBOOK

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15" TFT XGA (1024X768)

56K MODEM, 10/100 LAN

GEFORCE 4 GO 64MB DDR

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BUILT-IN 4-IN-I CARD READER

TV-OUT, FIRE-WIRE, INFRA-RED

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HL-86/P260DW-20 INTEL® PENTIUM® 4 2.6GHZ

HIGHIANDER

#### HIGHIANDER

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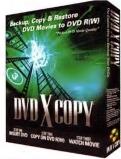


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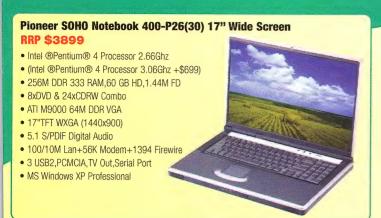
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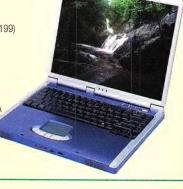
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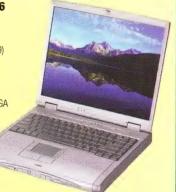
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# **GIVE BILL THE BOOT**

So Microsoft thinks it has no serious competitors? We'll see about that...

icrosoft has a very different business model to all the other technology companies that we deal with on a day to day basis. It is not a different business model because it's necessarily better, neither is it the business model that made Microsoft the dominant software vendor in the world. It's a business model based on the simple fact that Microsoft's biggest competitor is itself. And that fact alone must make Microsoft's 'real' competitors seethe in impotent fury.

When we speak to a product manager from a typical technology company there are several key terms that get thrown around – and I'm not just talking about 'end-to-end solutions'.

One of those terms is 'competitive', as in 'we have what we believe is the most competitive offering in this market space'. This is because most companies have one or more serious competitors in their particular market, and they are actively battling for the same potential customer base. Thus, one of the best ways for them to increase sales is to steal users away from their competitors. This process is great for us, as it encourages developers and manufacturers to closely scrutinise their own and their competitors products in an effort to improve their offering and grab more customers.

Another term often thrown around as a success indication is 'market share'. In the world of inkjet printers, for example, there are four main players, Canon, HP, Epson and Lexmark, all jockeying for a bigger piece of the pie.

The thing that makes Microsoft stand apart is you rarely hear their product managers throwing these terms around at all, and if they do, they mean very different things. Firstly, in many markets Microsoft simply does not have any serious competitors - at least, none that Microsoft is worried about. In fact, the main competitors to Microsoft's current products are their previous generations of products. For example, Microsoft is spending a considerable amount of effort figuring out how to get the vast proportion of existing Office users (using Office 97) to upgrade to Office 2003. When we've spoken to Microsoft product managers, there is nary a mention of the other office suites out there, not a peep about making a more broadly 'competitive' product, and when they talk about market share, they put up a pie chart showing what proportion of users are

using which version of Microsoft Office. That's not to say Microsoft is not trying to make better products - it is - it's just that it's doing so for different reasons to most companies.

But you know one really interesting thing that's been happening in the last few months? While Microsoft has stopped short of acknowledging it has a competitor, the product and marketing managers have actually been heard to utter the name of a competitor from time to time – often with a slightly questioning tone, a sly sideways glance and a raised eyebrow. And that competitor is Linux. Microsoft has exhibited more interest in Linux in the last few months than usual. Whether it's perceived as a threat or not is hard to tell at this stage, but I kind of hope it's not – if they decide to tackle Linux head on, I fear for the well being of penguins around the globe – although it might not come to that.

So, what we've decided to do this month is see if Microsoft is correct in its dismissive attitude of its competitors. We've rounded up alternatives to the main Microsoft consumer software, including Windows, Office, Internet Explorer and Outlook Express. We've also thrown a whole lot of stuff on the CD, so if you're keen to try them, and give Bill the old heave ho, it's now easier than ever.

I'd love to hear your thoughts too. Are there any Microsoft alternatives in your regular rotation? Why did you switch? As for myself, I had to ditch Internet Explorer because of a weird network protocol problem at work, and am now using, of all things, Crazy Browser, a front end for IE – and the funny thing is (besides the name), I like it more. The full story of my switch is on the *PC Authority* forums at www.pcauthority.com.au, so add your opinions and experiences there.

In other mag news, we've been getting plenty of positive feedback on the changes we've made to the back end of the mag. Tech Support and Mind Your Business have certainly sparked some interest, which is great. The thing is, there are so many topics to talk about, it's hard to know where to start. We'd love to get your ideas and opinions on what to cover, and we can make sure you get the support, tutorials and tech info on the subjects you want. So drop us an email or jump on the forums and let us know your thoughts.

Tim Dean, Editor – tdean@pcauthority.com.au



"in many
markets
Microsoft
simply does not
have any
serious
competitors – at
least, none that
Microsoft is
worried about."

#### **Next month**

The Labs team will be running the new GeForce FX and RADEON GPUs through their paces to find out which ones are worth your hard earned cash. We'll also be delving into the latest gaming technology and 3D engines to see how the next generation of games, like Half-Life 2 and Doom 2, will be blowing us away with their visuals, physics and Al. And if you have tapes, videos, LPs, photos - or just about anything in an analog format – we'll show you how to digitise it and get it on your PC so you can edit. share or just enjoy it every day. We'll also be looking at business storage to give you some clear options to suit your business's needs. And that's not all – there'll also be the usual monthly roundup of all the latest products, tech news. hands on tutorials and help.





# **PHOTOGENICIDE**

Mobile phones are capable of compromising your privacy, but banning them isn't the answer, writes **Valens Quinn**.

t one time a mobile phone was used to call people. These days, it's become the digital equivalent of a Swiss army knife: it can wake you up in the morning, keep track of your appointments, play video games, record memos, send emails and text messages, and download stock quotes, weather reports and what have you. But what really freaks me out is that now anyone who owns a mobile with a built in camera can become a member of the paparazzi, international spy, Internet porn magnate or God knows what else.

In fact, you've probably already heard the furore over use of mobile phones with cameras in the news this month. The fear is that these devices can allow someone to take pictures or record video of people without their knowledge, compromising their privacy. These pictures or video clips could then be sent to email addresses, stored on PCs, or find their way onto the World Wide Web.

While mobile phones have had the ability to take pictures for over a year, this ability has ballooned into a full-fledged menace after a Melbourne man pleaded guilty to making a video of young girls changing at a suburban swimming pool.

As a result, over 300 pools, gyms and sporting facilities have banned the use of mobile phones in change rooms.

While most of the banned change rooms are run by the YMCA and Royal Life Saving Society, it's expected that many privately run pools and gyms will soon follow suit.

There was also an incident last month where a mobile phone was used to take a picture of stockbroker Rene Rivkin during his initial weekend in prison. The picture then promptly appeared on the front page of a Sydney newspaper.

I spent some time using a Nokia 7250, which has a digital camera built into it. Unlike the first camera phones, which tended to look like they had a camera attached to them, the 7250 really just looks like an ordinary phone, and you'd be hard pressed to spot the lens on the back of it.

For a little while, I kept forgetting that I had the ability to take a picture pretty much any time that I had my mobile phone with me — which is always. After a while I started to use the camera quite a bit (to the extreme pleasure of Telstra, no doubt) and found myself snapping pictures of all of my friends at our various outings. And the fact that a mobile phone is practically connected all the time makes it very convenient to send pictures to email addresses,

or to store your favourites in the phone's memory.

While taking pictures of family and friends is one thing, I'm sure it won't take long for the more devious among us to figure out some novel uses for these phones that aren't so G-rated.

In addition, the Nokia 3650 is the first mobile phone in Australia that's capable of digital video recording and playback.

So suddenly, someone can steal more than just a quick snap of you – they can turn you into the unbeknownst start of a movie clip.

A future filled with millions of people who have immediate access to video cameras, who could photograph you without permission or knowledge and send images to anywhere in the world is a scary thought. However, we shouldn't go crazy and start banning this equipment outright because we're afraid of what might happen.

First of all, it's fair to assume that cameras and video recording devices will continue to get smaller and look less and less like what we traditionally expect. There are already cameras that don't even look like conventional ones — some are even creditcard sized and hidden away easily.

In addition, PDAs like Sony's CLIÉ or the upcoming Handspring Treo 600 also have built in cameras among many other features.

As such, we as a society need to raise our awareness that if someone has a phone, PDA, MP3 player or even a Memory Stick, this device may be able to capture a picture. To my knowledge, cameras are not banned in change rooms, probably because there isn't a problem with people using them as pointing one around would tend to get noticed. And this is exactly the same kind of awareness that we need to apply to digital devices. People need to start being extra vigilant of electronic devices used out of context, and simply banning them isn't practical because these devices have uses beyond just taking pictures.

Sooner or later, many of us will probably own a phone with a digital camera. But as owners of these devices, we too need to be aware that they can compromise people's privacy, and as such, we should keep them tucked in our pockets when our intentions might be confused.

So if you're phone rings when you're in a change room, don't answer it, or better yet, turn it off before you go inside.

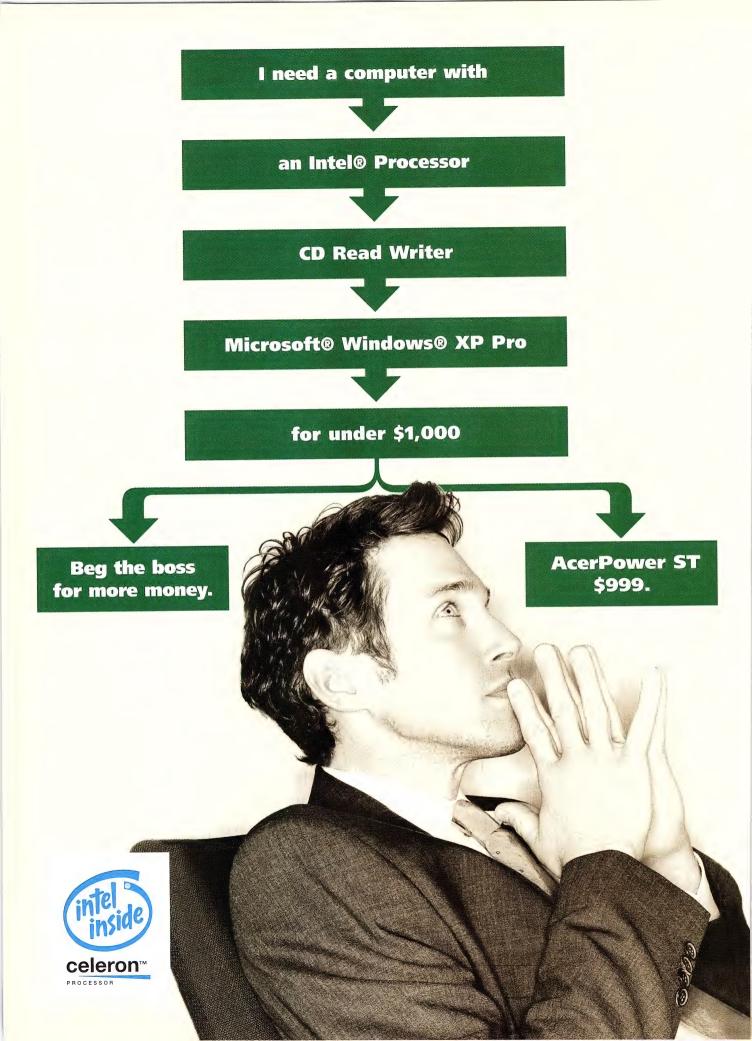
Send your comments to: vquinn@pcauthority.com.au



'So suddenly, someone can steal more than just a quick snap of you - they can turn you into the . . . start of a movie clip.'

# The unusual suspects

There are a number of products in the market that have built in digital cameras or the ability to record and send digital video. However, it's the combination of these abilities and Internet connectivity that make it so easy to transport pictures or video to wherever you want them. Mobile phone networks including Hutchison's Three, Telstra's CDMA-1X (Mobile Loop) or Optus and Vodafone' GPRS networks provide enough data bandwidth for sending and receiving email, downloading files including ring tones, pictures or Java-based games and applications, or WAPbased Internet browsing. We're also likely to see more phones like the Nokia 7250 (pictured top), which has a very discrete built-in camera, or the Nokia 3650, which lets you record and play video clips.



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Empowering People

# HORIZONS

PC Authority seeks out all the latest news in the world of technology, from local trends to global breakthroughs.

## MICROSOFT BRANCHES OUT

Microsoft lays the foundation with a new cable TV product and SPOT trials.

nnounced last year, Microsoft's Smart Personal Objects Technology (SPOT) uses FM radio frequencies to transmit data to watches, PCs, alarm clocks and anything else the company can work its way inside. Although it sounds like it could potentially become the world's biggest super wireless network, the service will primarily be used to deliver small nuggets of data like stock quotes, weather reports and messages. The service, called MSN Direct, is currently trialling in eight US cities and costs around \$US9.95 per



month.There's already a wide selection of funky SPOT watches hitting the market.

Like the radio waves, Microsoft spies a new market in cable TV. Delivering interactive television over a cable TV network requires some form of operating system, and Microsoft is hoping to come up with the goods first with its new TV Foundation Edition.

Apart from taking advantage of HDTV when it becomes available, the new system should allow digital recording, email, realtime pausing and digital rights management.

Currently, Microsoft has the support of US cable companies, but there is some speculation that the company is going to have a much harder time convincing set top box manufacturers to implement the technology due to already established Linux-based embedded alternatives. We beg to differ – Microsoft is quickly gaining weight in the content-delivery industry and if the cable companies are willing to relinquish some of



Microsoft hopes to enter the cable TV market with it's new TV Foundation Edition operating system.

their hold over content to Microsoft, then we're betting set top box manufacturers won't have much of a say in the OS.

www.microsoft.com

# **BIOS PHONES HOME**

New tracking tool allows stolen PCs to be tracked online.

new development in computer anti-theft tools has been announced which tracks the online movement of your walkabout PC or notebook. TheftGuard, developed by the Texas-based Softex for Phoenix BIOSes pings a server whenever it's connected to the Internet and consequently reveals the IP and other traceable information. All the user need do is report the stolen machine on the TheftGuard Website.

Currently, most remote tracking methods involve using tracking software on the hard drive, but this can easily be avoided by replacing the hard drive. By residing in the BIOS,
TheftGuard can not
easily be disabled
unless the
motherboard is
replaced – something
that's far too difficult
to do on a notebook for the casual thief,
considering most notebooks have
motherboards that are near to impossible
to swap out or even remove.

Thinking about flashing the BIOS to get rid of it? It's an unflashable component according to Phoenix.

To make matters more complicated, TheftGuard also resides in the Host-



Protected Area (HPA) of the hard drive meaning that it can't be erased by conventional FDISK-ing or formatting.

At the moment, the protection is designed specifically for PCs running a Windows operating system.

Look for TheftGuard in Phoenix FirstBIOS-based motherboards.

www.phoenix.com

Kids not cool on spam According to a report by Applied

Research and commissioned by Symantec, kids aren't comfortable with

spam. The report questioned 1,000

inappropriate content, and a half of

and 'offended' by the material.

www.caube.org.au

those reported feeling 'uncomfortable'

Munich moves to Linux

young people between the age of 8 and

18 of which 80% replied that they receive

# **BILL BUYS FRIEND, KILLS NETSCAPE**

Microsoft forms an unlikely alliance after a private settlement.

nstead of fighting off the opposition, Microsoft has done what Microsoft does best – shot a hefty cheque to the enemy. Microsoft and AOL have been in the middle of an 18-month private lawsuit over alleged anti-competitive behaviour to bring down AOL's fledgling (and redundant) Netscape.

The \$US750m peace treaty allows AOL to license key Microsoft technology for the next seven years.

Put another way, it allows Microsoft to cement over the growing legal weeds and at the same time destroy its main competitor in the browser battle. For the rest of us, this means that the largest technology provider and one of the largest media companies have now joined forces to securely deliver online content - something that AOL couldn't do on its own.

While specific details of the settlement aren't available at the moment, the deal grants AOL access to a great many things: browser technology, digital rights management, media player software and its own Redmond-based development team.

www.microsoft.com

## The city of Munich is the latest to join the

throngs of Europeans states drawn to Linux. Despite attempts from Microsoft CEO Steve Ballmer to discourage the move, the city will now switch 14.000 PCs to Linux with further plans to ditch Microsoft Office in favour of OpenOffice.

www.linux.org

# TV PHONE, NO REALLY

Samsung's new TV phone actually works like a TV.

ith all the hype surrounding 3G phones at the moment, Samsung has gone back to basics with its new SCH-X820 colour TV phone. Unlike 3G, which charges for video streamed over the mobile phone network, the X820 has a separateVHF/UHFTV tuner similar to a standard

portable television set. Equip this sucker with video output and you've got your own portable TV tuner just looking for a PC to plug in to.

Don't expect much in the way of a great TV viewing experience from the phone alone



The X820 streams video old-school.

though - it features a meagre 170 x 200 pixel screen and on a standard battery, you won't even get two hours of TV time. It also greatly depends on the quality of the antenna. which is shaky at best even on a standard, fixed TV set.

At this stage, we can't get any details as to when it'll be available outside

South Korea, but we wouldn't expect to see it hit our shores until around mid-2004. Currently, it retails for an Australian equivalent of \$880.

www.samsung.com

## CHIPPING NEWS

Sun and Intel update their portfolios.

his month's round of chip updates includes a revamp of Intel's Centrino and a slip in release from Sun's highend UltraSPARC line.

Intel has given its Centrino a mild face lift with better security features and a fix for problems that arose when accessing VPNs. The new chips feature speeds of 1.7GHz, 1.2GHz and 1.0GHz and should be appearing in notebooks and tablets as of now. Sun's update to its hardcore 64-bit Itanium

⊖Sun's new UltraSPARC IV will feature two USIII processors on a single piece of silicon, but not until 2004.

killers have slipped past their initial due date, with the UltraSPARC IV moving to 2004 and the UltraSPARCV slipping from 2005 to 2006. Head over to www.pcauthority.com.au for more updates.

www.sun.com www.intel.com

Napster's back, sort of

Napster is due to make a comeback after Roxio's recent acquisition of online music download service PressPlay. Roxio, who also owns the rights to Napster will use PressPlay's system to relaunch a legal version of Napster.

www.napster.com

## The people's notebook

Thailand's Information and Communications Technology Ministry has had so much interest in its plan to provide cheap, low cost, Linux-based notebooks that there are fears that HP won't be able to supply enough. The initiative, which was conceived to increase PC ownership of ordinary Thais has proven too successful for a single supplier and there is speculation that Dell might be called in.

www.nectec.or.th/eindex.php

### Palm goes full circle

Palm has announced it will buy rival Handspring, which was founded by Jeff Hawkins, after he left Palm. The merging of the two companies allows Palm to broaden its product range with Handspring's popular Treo PDA/phone, although it's unlikely to dramatically increase Palm's overall market share.

www.palm.com

#### **TOP FIVE SITES**

Each month PC Authority brings you the top five sites visited by Australians in various categories, including search engines, email, banks and restaurants.

#### **SEARCH ENGINES**

www.yahoo.com	21.81%
www.google.com.au	18.65%
www.google.com	6.62%
www.msn.com	6.29%
au.yahoo.com	6.23%

#### **EMAIL**

www.hotmail.com	-	69.19%
mail.yahoo.com		11.90%
mail.yahoo.com.au		6.55%
address.yahoo.com		0.84%
avatarfile.hanmail.net		0.71%

#### **BANKS**

www.netbank.commbank.com.au 17.89%
www.commbank.com.au 15.44%
www.anz.com 10.94%
www.westpac.com.au 10.47%
www.national.com.au 7.44%

#### RESTAURANTS

www.pizzahut.com.au	12.04%
www.mcdonalds.com.au	11.97%
www.dominos.com.au	9.49%
www.bestrestaurants.com.	au 8.21%
www.miettas.com.au	7.47%

#### **HUMANITARIAN SITES**

www.worldvision.org.au	16.88%
www.amnesty.org.au	10.09%
www.boystown.com.au	8.22%
www.caa.org.au	6.44%
www.salvationarmy.org.au	5.57%

#### LOCAL CAR SITES

www.carsales.com.au	5.49%
carpoint.ninemsn.com.au	5.34%
www.drive.com.au	4.06%
www.rta.nsw.gov.au	3.62%
www.holden.com.au	2.13%

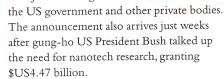
Statistics provided by Hitwise (www.hitwise.com). All figures represent the relative market share per category.



# MIT AND ARMY TOGETHER AT LAST

MIT and the US Army have joined forces to create the first nanotech centre for soldiers.

he Massachusetts Institute of Technology and the US Army have launched the first nanotechnology centre of its type specifically for the Army, after joint funding from



The new Institute for Soldier Nanotechnologies will focus specifically on enhancing the effectiveness of soldiers in the battlefield, focusing on sensors, self-healing armour, stealth systems and communication



on the battlefield.

While not exactly computer related, anything MIT does is worth a mention, particularly if it involves nanotechnology, and even more so if it involves the

US military. We're not warmongers, and although it might seem military specific, the core elements of this type of research will result in a better understanding of how the human body interacts (and interfaces) with the environment, and should consequently have a huge impact on medicine, artificial intelligence, user interfaces and entertainment.

http://web.mit.edu/isn/index.html

## WASTE GETS WASTED

Daddy pulls the plug on revolutionary file-sharing 'chat' code.

ullsoft's parent company, AOL Time Warner, has yanked a small piece of code off the Web that could radically change instant messaging and online chat services. Respected programmer extraordinaire Justin Frankel, most notable for Nullsoft's ubiquitous Winamp media player, had begun work on an encrypted, decentralised chat network similar to his other file-sharing application, Gnutella.

The new system, called Waste, is independent of monitoring by external parties, and as a base network it could theoretically be used to trade files like any other file-sharing service. Only this time, it's encrypted. Naturally AOL, with a vested interested in its own instant messaging service and an understandable aversion to all things file-sharing, quickly pulled the code down and probably gave Frankel a pretty stern talking to. In response, Frankel has just leaked a message that he may leave the company.

Unfortunately for AOL however the damage is done. The code has already been downloaded by enough people to begin development, and we'll likely see various implementations of underground Waste-based private, encrypted communities in the coming months.

www.nullsoft.com

## THE FOURTH SUB-PIXEL

Samsung announces new TFT technology.

his year's Society for Information Display (SID) conference saw the announcement of Samsung's new TFT technology, which potentially solves the problem of poor luminance in current TFTs.

Typically, each pixel in a TFT screen is made of three sub pixels, one each for red, green and blue. The overall brightness of the screen

however is decreased by about a third due to the backlight having to pass through the pixel filters. Samsung has designed a new method which places a fourth 'white' sub-pixel in the array, reportedly increasing the luminance by up to seventy percent. No word yet on a local release but watch this space.

www.samsung.com



# Wireless-G [802.11g]



#### WRT54G

Wireless-G Router

- · All-in-One cable / DSL-sharing Router, 4-port Switch, and Wireless-G (draft 802.11g) Access Point
- Data rates up to 54Mbps -5 times faster than Wireless-B (802.11b)
- Also interoperates with Wireless-B clients (at 11Mbps)
- · Advanced wireless security with WEP encryption, and MAC filtering



#### WPC54G

Wireless-G Notebook Adapter

- · High-speed Wireless-G (draft 802.11g) networking for your notebook computer
- Data rates up to 54Mbps 5 times faster than Wireless-B (802.11b)
- Also interoperates with Wireless-B networks (at 11Mbps)
- Enchanced security up to 128-bit data WEP encryption



#### WAP54G

Wireless-G Access Point

- Set up a high-speed Wireless-G (draft 802.11g) network in your home or office
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- · Also interoperates with Wireless-B networks (at 11Mbps)
- Advanced wireless security with WEP encryption, and MAC filtering



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- · Put your PC wherever you want, with no cabling hassle

















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# **64-BIT MYTHS AND MYSTERIES**

Is it really worth having 64-bits under the hood? Tim Dean delves into the tech to find out what all the fuss is about.

#### HyperTransport

HyperTransport was developed by AMD, but is now run by a consortium including big players like Apple, Cicso, NVIDIA, Sun and Transmeta. HyperTransport is basically a point-to-point bus, like PCI, but it runs at vastly higher speeds. It's also inherently scalable, and can be anything from 2-bits to 32-bits wide, allowing it to be customised for its application. Maximum bandwidth is 12.8GB/s, which is more than enough for today's applications, and should provide some headroom for technologies to come. It's also backwards compatible with PCI, so it's easy to implement and doesn't necessitate rewriting much code. The Opteron sports three HyperTransport ports, while the Athlon 64 has just the one.

www.hypertransport.org

### **EPIC** proportions

The EPIC architecture is all about making the processor more efficient. The idea is to streamline the processor and allow it to do as much work as possible in every clock cycle. By using advanced prediction techniques, an EPIC CPU will run several instructions on several bits of data simultaneously. While this is a good philosophy in principle, it makes the CPU quite complex, and software needs to be written for it from the ground up. As the technology matures, though, it should eventually challenge the dominance of RISC and CISC technologies on the desktop.

4-bit computing is coming. Well, that's not entirely true, because 64-bit computing has already been with us for over 10 years. In 1992, DEC (Digital Equipment Corporation - now a part of HP-Compaq) released the Alpha 64-bit processor, running at the then blistering speed of 200MHz - remember, this was a time when the 66MHz 486 DX2 was top of the line in the consumer space.

Since then we've seen a number of 64-bit processors hit the market, such as the MIPS R series, Sun UltraSPARC, IBM PPC 970 and more - all targeted at high-end computing applications, such as scientific analysis, or running large back-end servers.

This year though, 64-bit computing comes to the masses. The plebeians. The mensch. The demos - ie. you and me. And it's coming in the form of AMD's new AMD64 architecture (previously known as x86-64), as well as Intel's IA64-based processors, to a lesser extent.

The interesting thing is both chip giants have taken very different approaches to the 64-bit proposition, and both are approaching it from very different directions. This fact, coupled with a broad uncertainty about what '64-bit' really means, makes things potentially very confusing. In this article, we'll look at some of the underlying technology of 64-bit computing, dispel some myths, and then check out the differences between AMD and Intel's offerings.

#### 64-bit isn't always twice 32-bit

First off, it's important to understand what a 64-bit processor really does, and what potential benefits it has over a 32bit processor. Many commentators make the mistake of claiming that a 64-bit processor can work on twice as much information at the same time compared to a 32-bit processor, and while in some ways this is true, this does not equate to a doubling in performance.

The Itanium 2 uses its own socket connector, which is called PAC611.

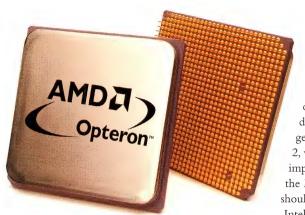
TANIUM. In fact, at its essence, a 64-bit processor is just one that can work with numbers that are up to 64 bits long instead of 32 bits long. Each bit is a binary digit represented by a 1 or a 0, and each additional bit to a binary number means it can represent a greater range of numbers. This range is also referred to as the 'dynamic range' (see table below).

Increasing the dynamic range of a processor has the advantage that it can more easily manipulate larger numbers, but that's only of limited benefit even in high-end applications. It's not often your CPU will need to be throwing around numbers larger than 4.3 billion, and if it does come across one occasionally, it can always split it up, although at the cost of performance.

One of the real benefits, though, is the ability to access more physical memory. At the moment, and without using dirty programming tricks and workarounds, a 32-bit processor can only access 4GB of memory. This is because each bit of memory needs to have an address so the processor can find it. When you have 4GB of memory, you've used up every number a 32-bit processor can represent as an address, and there's no (easy) way for the processor to be able to recognise more memory.

On the other hand, a 64-bit processor can potentially access up to 18 million terabytes (18 billion gigabytes). Not that anyone would want that much yet, but there are plenty of

Bits	Exponent	Max number represented
1-bit	21	2
2-bit	$2^{2i}$	4
3-bit	23	8
4-bit	24	16
8-bit	2 <sup>8</sup>	256
16-bit	2 <sup>16</sup>	65,536
32-bit	232	4,294,967,296
64-bit	2**	18,446,744,073,709,500,000



The Opteron and the upcoming Athlon 64 are much the same except for the number of HyperTransport links.

applications where 4GB is not enough, such as with large database servers, 3D CAD and scientific analysis.

Performance benefits will also come once software is written specifically to take advantage of 64-bit processors. In this case you can get a 64-bit processor to perform an instruction on a larger chunk of data in one operation, but again, this is only of benefit if you're working with very large numbers, or you need very high integer precision. As such, your day to day office applications and games will see very little benefit or improvement from 64-bit technology.

So, at the end of the day, the main performance-related benefit of 64-bit computing is the ability to access more memory. As many of the PCs being sold today are supplied with 512MB of RAM, it's reasonable to assume that PCs being shipped in a couple of years time might well come with 4GB as standard, in which case you'll be wanting to think about a 64-bit processor so you're not limited to that. Even so, we're talking 2006 or so before that becomes a real performance issue for most of us.

One side benefit that comes from some 64-bit processors, like the 32-bit/64-bit AMD64 processors, is an increase in the number of registers, or GPRs (General Purpose Registers). Registers store each piece of data just before being operated upon, so the more registers, the more data can be made ready to process — although this raises other challenges of how best to manage these registers to make sure they're optimised. Still, more registers are a good thing for programmers.

#### Intel's approach

Intel has been working on its 64-bit processor, along with HP, since 1994, and it wasn't until

1999 that the details of the first generation, the Merced, were officially announced. The Merced, officially called the Itanium, eventually proved to have performance too poor for Intel to offer it as a real commercial product. It did lead the way for the second generation, the McKinley, or the Itanium 2, which is now beginning to make an impact on the market. The third generation, the Madison, to be released later this year, should also kick things up a notch.

Intel's approach to 64-bit is pretty serious, and it's inexcusably targeted at the high-end computing market, and not at the desktop. Intel is hoping to compete with the existing 64-bit platforms, many of which are based on Unix and used to run large data centres or powerful supercomputers – all very lucrative potential markets for Intel.

Intel's 64-bit technology is called IA64, and has a number of interesting features. First is EPIC (Explicitly Parallel Instruction Computing), which differs from the CISC (Complex Instruction Set Computing) of common desktop processors, and the RISC (Reduced Instruction Set Computing) technology of other high-end processors. Basically, EPIC is all about allowing the processor to run as many instructions simultaneously as possible. As such, the Itanium range of processors has heaps of registers, pipelines and advanced speculation and prediction capabilities to allow it to manage this.

An important thing to note with IA64 is that it cannot run old-school 32-bit code in hardware. It first has to translate it into code that it can understand, and then run it. As such, the Itanium range suffers a significant performance hit when running 32-bit software. Intel doesn't see that as a problem though, because the Itanium isn't intended to run 32-bit software at

all. In its intended applications, it'll only be running 64-bit apps. It's in this point that AMD and Intel differ the most in how they see 64-bit processing rolling out into the market. Intel is quite happy offering its Pentium range of processors for the consumers, and having the

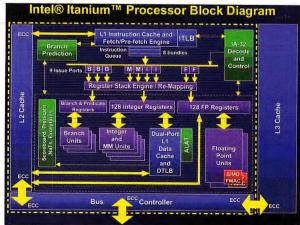
#### Madison

The first Itanium was codenamed Merced, and the Itanium 2 was the McKinley next in line is the Madison, due out shortly. The Madison is very similar to the McKinley core, but is manufacturered on a 0.13-micron process, has a larger 6MB L3 cache and runs at higher frequencies, up to 1.5GHz. It's also likely that Intel will have some slower versions available as well. The next step after Madison is the Montecito. which is rumoured to be a more significant update to the architecture. The Itanium line has not been a big seller so far for Intel, and will be placed under further pressure on the low end by the Opteron, so we can expect pricing from Intel to get more competitive.

www.intel.com

#### Inside and out

The Itanium 2 might have a clearly more advanced architecture, but it's external interface is still relatively conventional. The Opteron, on the other hand, has a simpler core, but with HyperTransport, its external connectors are very advanced, giving it an edge in I/O performance and making multi-CPU less complicated to implement.



#### Athlon 64

While the Opteron is being targetted at low to mid-range servers and developers, the Athlon 64 will be aimed at hitting the high-end workstation and performance market. At the moment there is not much need for a 64-bit workstation processor, although for applications like high-end software or games development, it could become a handy tool. Early indications are that is could be very fast in 32-bit mode too, making it a potential winner among enthusiasts and gamers.

#### Registers

Registers are the temporary storage areas where data is kept just as it is about to be operated upon. The greater the number of registers, the more data that can be worked on at any one time and the less memory accesses that are required. There are typically registers

for general integer operations, as well as additional registers for floating point data, SIMD and data like SSE and 3DNow!. The x86 architecture has provision for only eight integer and floating point registers, which is a major limiting factor to the future of the architecture.

Itanium sit quite apart for now. In time, we'll see 64-bit technology in Intel consumer processors, but not for the next few years.

#### AMD's take

Unlike Intel, AMD has gone for a more conservative approach. Instead of making a dedicated 64-bit-only chip, the AMD vision is of a dual-purpose chip, one that can run 32-bit and 64-bit code in hardware, and ideally get the best of both worlds. This is more like the processors that made the transition from 16-bit computing to 32-bit. The 32-bit 386 came out in 1996, but it wasn't until the Pentium Pro in 1995 before things would get 32-bit all-through.

As such, the AMD64 architecture is not as revolutionary a change as IA64. The first AMD64 chip is the Opteron, targeted at the mid-end server and development market, and later this year we'll see the Athlon 64, which is targeted more at the desktop, workstation and consumer markets.

Both processors are similar in nature to the current Athlon range, and the main differences are in the addition of eight more general purpose registers, and eight more SIMD registers (for SSE and SSE2 code), all of which are 64-bit. This allows the processor to handle 64-bit data and instructions, and gives programmers a little more flexibility with the increase in registers, although the increase cannot compare with the number of registers in the EPIC Itanium.

The memory controller has also been moved from the Northbridge of the chipset onto the processor itself, which has the advantage of allowing the memory speeds to be more scalable with the processor, and also eliminates the memory bottleneck between the Northbridge and the processor. This change alone should boost performance significantly.

Another feature of the Opteron and Athlon 64

are their support for the HyperTransport bus, which connects each processor to each other and the motherboard chipset. One benefit of HyperTransport is that it's scalable, allowing it to fulfil a variety of roles. There's a 16-bit HyperTransport between the CPUs, giving 6.4GB/s bandwidth, and an 8-

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One reason for the massive increase in transistor counts in processors recently is the inclusion of huge amounts of cache memory, which takes up over half the Opteron core above.

bit HyperTransport bus connecting to the rest of the system at 3.2GB/s. The main difference between the Opteron and the Athlon 64 is the number of HyperTransport busses supported. The Opteron supports up to three links, thus allowing it to be used up to 8-way. The Athlon 64, on the other hand, only has one link, so can only be used singly.

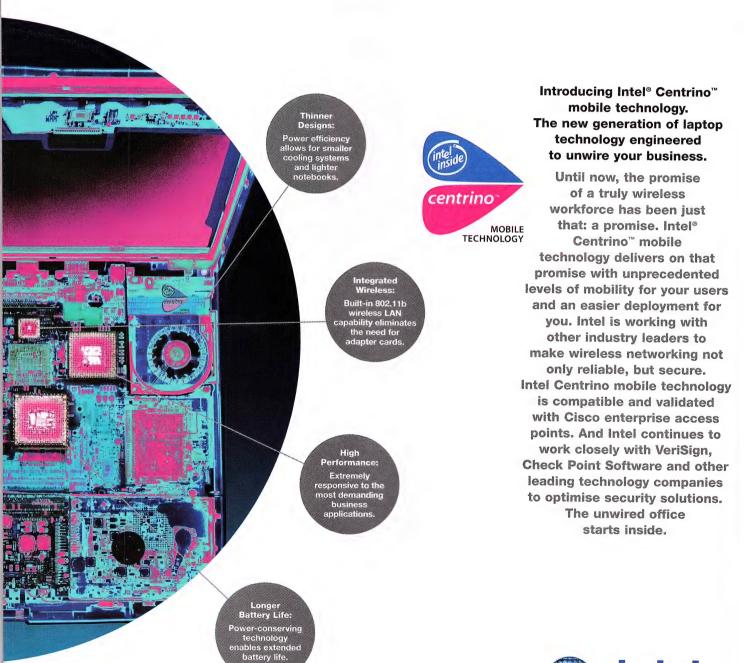
While opting for a dual 32-bit/64-bit processor seems to be a compromise option, it does give AMD a unique product offering in the market. Intel continues to push its discreet 32-bit and 64-bit lines separately, while AMD is hoping it can appeal to the not-so-high-end market that is not quite ready to move lock stock and barrel over to Intel's fully 64-bit Itanium, and instead wants the advantages of 64-bit, such as increased memory capacity, without having to change everything else too.

One thing to keep in mind about the Opteron: AMD is not referring to any of its 64bit processors by frequency. They now have a three digit code, with the first digit being the number of processors supported, so an 8xx Opteron can be run up to 8-way. The second two numbers are a 'performance rating' that is a little ambiguous, but we know they're supposed to be relative to other AMD 64-bit processors.

Time will tell which approach is the better one, although this could well be a pivotal time for AMD. If the AMD64 venture fails, AMD could be backed into a corner from which it may never return. If it works, though, AMD could significantly strengthen its position in the market. The Labs team is in the process of gathering all the necessary components, and as soon as we have a look at the 64-bit version of Windows, we'll be running a thorough analysis of how the two platforms compare.

Specs	Itanium 2	Opteron
Process	0.18 micron	0.13 micron
Transistors	221 million	100 million
Maximum frequency	1GHz	2GHz (est.)
L1 cache	32KB	128KB
L2 cache	256KB	1MB
L3 cache	3MB	N/A
HyperTransport busses	0	3
Integer registers	128	16
Floating point registers	128	8
SIMD registers	0	16
Maximum processors	8-way	8-way

# The unwired office starts inside.



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ff Stylish and bursting at the gills with features, this monitor deserves to make a significant impact on the LCD market. "

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ff This screen truly represents the leaps and bounds TFT technology has taken, and is a great buy.

- Dan Chiappini, PC Authority Magazine, June 2003

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- Australian PC World, May 2003





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# SCO-IN' OFF!

**David Kidd** looks past the battlefield and finds a shadow lurking over the hill.

y now, you've probably heard about the case that SCO has brought against Linux. I haven't commented on it for two reasons.

Firstly, I think it's ridiculous. Secondly, I was waiting for the world, and the courts, to see it for what it was and then make a decision. Sorry, I can't wait.

If you haven't heard, I'll recap. (But a word of warning, this is a complete shit fight – I'll be succinct, lest I go on forever).

A couple of months ago, SCO brought legal action against IBM for releasing SCO-owned source code to the Linux community. No one knows what the alleged code was, although SCO has released it to a select bunch of analysts and industry folk who are bound to secrecy by a non-disclosure agreement. The most recent development at the time of writing is that SCO and IBM failed to reach an agreement and SCO has terminated the license that allowed IBM to distribute SCO-owned versions of Unix.

Obviously, the Linux community isn't happy about it, but there isn't much they can do without seeing the encumbered code. President of the Open Source Initiative and old-school Unix coder Eric Raymond sums up community sentiment: 'We wrote our Unix and Linux code as a gift and an expression of art, to be enjoyed by our peers and used by others for all licit purposes both non-profit and for-profit. We did not write it to have it appropriated by men so dishonorable that after making profit from our gift for eight years they could turn around and insult our competence.' Pow!

Whatever Raymond has to say he can't deny the gravity of this claim for the future of Linux. The GPL specifically states that the source code can only include content that doesn't have conflicting patents. But again there's some controversy here that says if SCO distributes Linux itself (which it has) then the original ownership over its IP property is now void.

But these are details, and cost-conscious corporations don't get details – they get letters. SCO kindly contacted major US enterprises advising them to seek legal advice if they want to continue using Linux. The damage is now done.

Naturally, the question everyone's asking is: does SCO own Unix? This is wrong in two ways. Firstly,

The Open Group owns the name Unix and is the only body that can approve the use of the name for a Unix product (which, incidentally, is at the heart of a separate trademark case involving Apple's use of the Unix label). Secondly, according to Novell, SCO doesn't own the code, Novell does. Novell sublicensed it to SCO who then struck up the deal with IBM. SCO however says the case still stands, as this was an agreement between IBM and SCO.

This incestuous legal love-in gets even more convoluted. There's another idea that's floating around that says that the code may have actually flowed *from* Linux *to* Unix. But without evidence, this still misses the legal point that SCO has the rights to something which IBM 'Robin Hooded' to the open source community.

So legally this is a case about intellectual property. Speculatively, this is the slow, wretched death of SCO. Idealistically, it's a case of SCO gussying itself up for a buyout. And in reality? Linux, SCO, and IBM are swimming in a toilet bowl, climbing on top of each other to get some air.

And who's standing over the top waiting to flush? Microsoft. You didn't think that it would stand by and watch while Linux scratched at the bugs crawling under its own skin did you? Just after SCO brought the case to the public, Microsoft did the noble act of licensing SCO's Unix technology to demonstrate its commitment to protecting intellectual property and its willingness to improve its support for Unix. Right.

Of course, it *could* be licensing the technology to improve Windows' interoperability with Unix; it *could* be standing up for its firm beliefs about IP; but it looks to me like it's handing SCO a big cheque to sprinkle more FUD over Linux. It could have been enough just to sit back and watch its competitors implode in the legal minefield of the open source landscape, but Microsoft didn't get to where it is now by being passive.

It's unfortunate that the image of open source will be tainted regardless of the outcome. But the real kicker for the industry is that no matter what happens, Microsoft will again come out on top.

#### WHAT DO YOU THINK?

Email me at dkidd@pcauthority.com.au.



'Speculatively, this is the slow, wretched death of SCO. Idealistically, it's a case of SCO gussying itself up for a buyout.'

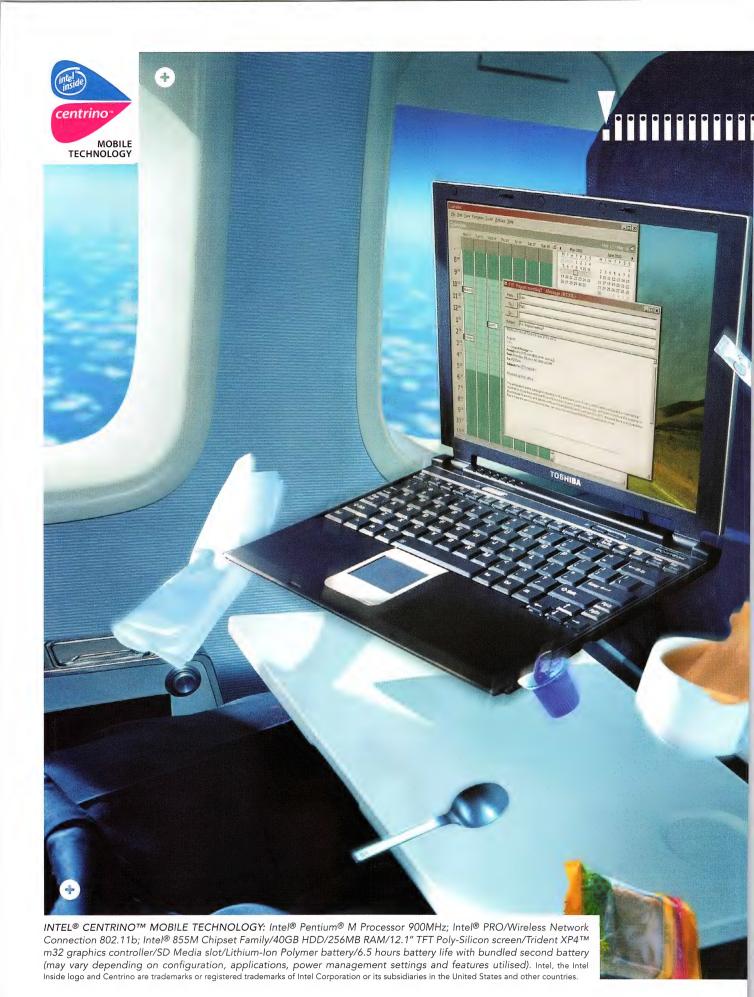
# A bloody mess that is

Think the hundreds of Linux flavours is a confusing industry? Well, it's just picked up some bad habits from it's father. The decades-long history of Unix is like a massive, inbred family lifted straight out of the Chattooga river in Georgia. But the answer to SCO's problem could lie somewhere in here – check out the family tree yourself at www.levenez.com/ unix/history.html. It's no wonder Linux inherited some bad blood.

#### Dukin' it out

Still not making sense? You're not alone. Get yourself over to www.arie.org/doh and check out the SCO vs Linux issue – retold as an exciting episode of the Dukes of Hazard.







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ACTION: See your nearest Toshiba Authorised Reseller, visit www.isd.toshiba.com.au or call 13 30 70 for more information.

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Got something to say? If you have a good story, an amusing anecdote or a tale of woe, we

want to hear from you. The pick of the post could win a copy of Windows XP Pro.

#### Working the workhorse

In my opinion, whether IBM compatible PCs run faster than Apple computers is totally irrelevant.

I don't own Apples, but I do own Acorn Risc PCs. which I use for all my photo editing, and any word processing that does not require output to a Word document. Why? Because the amount of maintenance that my Toshiba Satellite notebook requires, which runs Windows 98SE, is absolutely horrendous.

A couple of days ago I relegated 600MB of collected rudies to three ZIP disks. Having deleted them from the notebook hard disk. I used Norton's SpeedDisk for a solid night's worth of drive defragging.

Windows 98 'Defrag' got me going again for now, but for how long? Will I really have to 'ghost' the hard disk contents to another 12 ZIP disk, so I can reformat that hard disk before reloading? Will I be refused access to

the reload, since MS insisted on an OEM-specific version of Windows 98SE?

I spend nearly as much time with OS maintenance as I do using the laptop for Web browsing and downloading the photos. The filing system does not seem up to the task of moving files frequently on and off the hard disk.

In my view, this makes any IBM PC unsuitable for the task that it was bought for, when comparing down times with, say, your digital camera, car, washing machine or microwave.

Since 1992 I've had exactly three hard disk problems on Acorn computers, all of which were fixed by third party software in under a minute. Those Acorn Risc PCs are dinosaurs but I regard them as workhorses. and this Windows laptop as

What is the point of having 10 times the relative processing power if the bloody thing is being maintained one-third of the time it's switched on? H. Falkner

#### Pay your own way

We all respect a software company's right to protect their products from piracy. like Microsoft's compulsory activation of Windows and Office. Recently I had the misfortune to have a hard disk fail and I had to replace the disk, restore all my backups and reinstall some programs.

The Microsoft applications were easy: connect to the Internet, press a button and I'm back in business in seconds. Quicken Cashbook V8, not so easy?

The Internet activation didn't work, so I looked up their support number on their Website and rang to ask for a registration number. After pressing several buttons I was told by a computerised voice that as this was not the first activation of the product I had to dial a 1900 number, which would cost me \$9 to get it activated. I dialled again and this time got through to a support drone, who refused to help and kept repeating that it is 'company policy' to charge for the activation code after

the first time. I couldn't find anything in the license agreement where it says anything about having to pay for their copy protection.

I have around 10 programs on my computer that require activation, if all companies acted in the same greedy way as Quicken, it would cost me \$90 every time I change some hardware in my computer.

Next time you buy software. check on the activation procedure, and ask if they charge for activation codes after the initial installation. If they do, tell them they can pay for their own anti-piracy measures and look for an alternative product. N. Jays

#### David Kidd replies:

We spoke to Quicken and found that it was indeed true, except under exceptional circumstances. We were told that the reactivation fee was necessary for Quicken to run the reactivation service.

We wholeheartedly disagree with this form of product activation. Product activation on its own should be enough to curb piracy without having to

#### STAR LETTER PRIZE

Our Star Letter this month wins a great CD labelling kit from CD Stomper. The kit includes software with over 1,300 clipart designs and templates, a set of die-cut labels including 50

case inserts. We've also thrown in an extra stack of labels, so there is no excuse for black felt-tip, chicken scrawl



charge users that regularly change hardware or reformat their PC.

We believe that the costs of running the service should be negated by the extra cash flow taken in by preventing piracy. And if product activation isn't making enough money to cover the cost? Then there's no point.

We understand that piracy must be factored into the cost, and this could simply drive the initial cost up. In our opinion, penalising those who have suffered a hard disk crash or need to reformat is not good business.

#### **Website blues**

Recently I discovered the wonderful world of the Web. Oh the joys of shopping and finding out about products without the hassle and pressure of a salesperson.

My disappointment however lies in the Sharp Website. The saga started after my beloved nine yearold microwave/convection oven decided it didn't want to convection no more.

Working in a call centre environment we are not allowed to make personal calls at work so I opted for the convenience of sending an email off to the Website. One week later, no acknowledgement or reply. A second email was sent off and still nothing. Five emails later and a phone call had me seeing red.

Another email has been

sent and to date 'Simply the best from Sharp' haven't even replied to it, and since March I am no closer to solving the problem.

To date, I have also boycotted the purchase of any Sharp products.

If you are going to offer consumers a Website it is important to acknowledge emails especially if advising customers to email their enquiry in! All this angst could have been avoided by just acknowledging my email. It's 'Simply the best' thing to do. Paula

#### The big bang

It was a big BANG. I mean it was coming from the computer's direction! I looked under the desk, it was still there, it didn't even stop! It sounded scary, computers do not usually BANG big. No smoke either.

OK, calm down, think. On the first thought I was going to call the police terrorist squad, as per advised in the case of big bangs. I thought about



The April edition had a huge impact.

who my enemies might have been (I have no connection to the underworld, but was close to it at the bang). However my curiosity took over. disregarded the advice of the John Howard's pamphlet.

It's time to be brave, to play 007 and start the investigation. I switched the box off, plug pulled. Carefully, I opened the side, looked in, and found just dust. So what was the bang?! I powered up again, (with a broom handle from behind the door), hey it did not bang. Fans were humming good, POST OK, no faults. OS boots fine.

One explosive only, I thought. Scratching my head, what was I doing when the bang happened? I was just installing some software from the PC Authority cover CD drive. Something started to dawn. I carefully pressed the CD drive open button. IT DID NOT OPEN!

In that moment I knew that I was facing the local 'terrorist' organisation, distributing bangs for computers and destroying CD drives.

I pulled apart the drive and found your CD in an altered state, multiplied in small and varying shapes. Presto, a new jigsaw puzzle! Just like at the BIG BANG ten billion vears ago.

I never saw or heard about this happening, but here we are. I buy PC Authority magazine with all my goodwill and some of my well-earned money, and BANG, new CD drive required, not to mention lost faith and the CD with Partition Magic 6.

This time I was lucky, it was only a humble CD drive. Just imagine if it were a Ricoh DVD-RW - instantly half a grand gone. I wish you well, (better than happened to me), and I hope you smiled a little. G. Suto

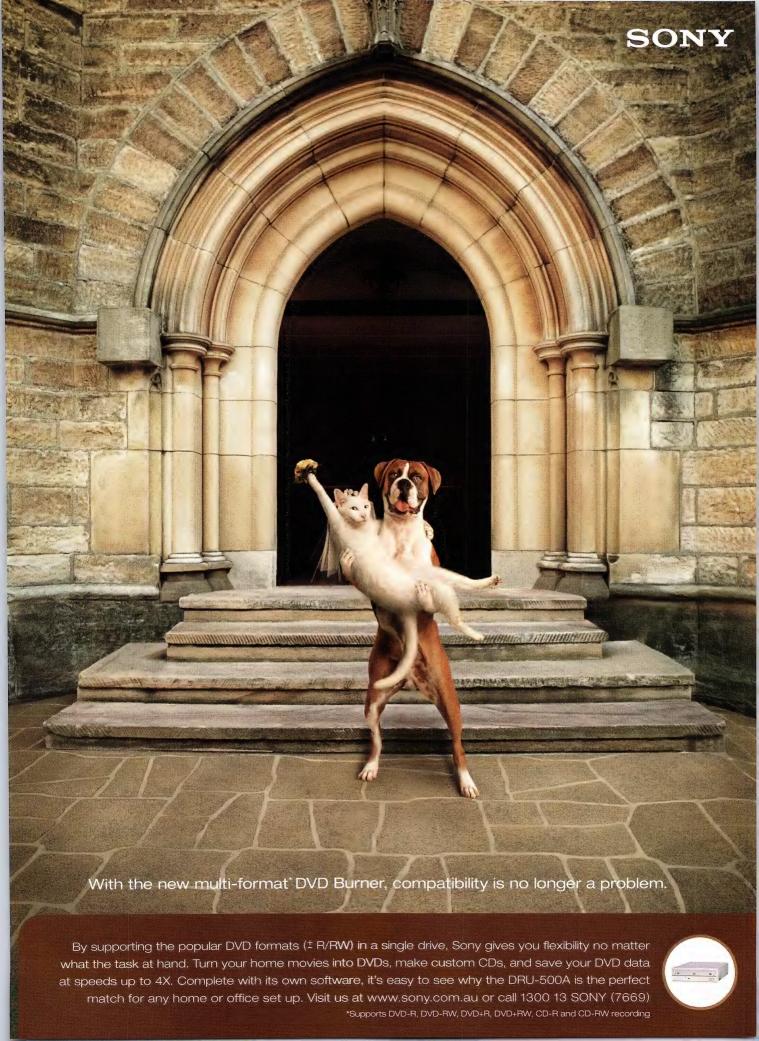
#### Tim Dean replies:

Big bang indeed! We've sent out a new CD, but unfortunately had no luck finding a spare CD-ROM around the Labs that could be used as a replacement. Maybe a benevolant supplier out there would be kind hearted enough to offer one to Mr Suto?

#### **GETTING IN TOUCH**

#### **COMPETITION WINNERS**

Winner: S. Jones, VIC



# 

Only the absolute best of the best make it on the A-List. Check out the Upgrade guide, telling you what spec to aim for when buying or upgrading your PC.

#### **P4 MOTHERBOARD**

#### Gigabyte 8PENXP

**PRICE:** \$582

**SUPPLIER:** Synnex

1300 880 038

ISSUE: Labs Winner, July 2003, page 77

You might be wondering why the Gigabyte 8PENXP costs

\$582. The short answer is it's features.

It has all of them.

While this might seem expensive, it's still a lot cheaper than purchasing add-on cards, making it very good value.



#### DESKNOTE

AUTHORITY

#### Acer Aspire 1703SC

PRICE: \$2,999

SUPPLIER: Acer

1300 366 567

ISSUE: Recommended, August 2003, page 47

The Aspire 1703SC is a groundbreaking machine. The 17in display looks gorgeous with its 1,280 x 1,024 desktop, and it's a delight to use. Although too heavy to be truly portable, the Aspire 1703SC still has the goods to be a worthwhile buy.



#### **DOCUMENT CREATION**

#### Adobe Acrobat Professional 6.0

PRICE: \$949, upgrade \$299

SUPPLIER: Adobe 1300 550 205

ISSUE: Recommended, August 2003, page 66

Acrobat Professional 6 represents a major overhaul of the creation and review of PDF files, while new high-end design capabilities add to Acrobat's existing strengths, making Acrobat better than ever.



SUPPLIER: Creative Labs Australia (02) 9666 6100 ISSUE: Recommended, December 2002, page 54

#### VERDICT

Dell's PowerEdge range is almost exclusively built for small business users, offering a great fusion between price and performance. The 600SC offers an unbeatable mix of good performance and value for money making this an essential inclusion for any small business network.

The first digital SLR to truly compete with 35mm film SLRs. A superb design makes it an extremely versatile package built from the ground-up for the needs of the professional photographer.

This Sony flat-CRT is simply the top choice if you're in the market for a 19in monitor. Rich colour and a fine, crisp image lends the Sony superior image quality, and at the highly competitive price of \$1,099 you can't go wrong.

It may not have much built-in memory or the fastest processor, but this is a well-built, light and stylish PDA. A bargain at \$239.

A smart mini-DV cam with more features than most, with the added bonus of excellent image quality. Although it was a close call, the DCR-TRV50 got the nod from the panel as the quality DV

ABIT went a little nuts with the OTES's heatsink, but it's an exceptional card that delivers great performance for a very reasonable price.

If you want clear and crisp PC speakers, you can't go past the Klipsch ProMedia 4.1. Fine sound quality with high output levels and low distortion make this set the best we've heard.

The Audigy 2 offers an amazing array of features, superb sound quality and a great software bundle. It may try to be all things to all people, but it does a fairly decent job of it.



# I need a notebook with a two hour repair service warranty.

For most businesses, down time is costly. That's why we provide a unique 2 hour Commitment Warranty Express Service\*\* on all Acer notebooks - such as the TravelMate 284XC powered by the Mobile Intel® Pentium® 4 Processor - M. Simply take your notebook to any Acer repair centre in Australia or New Zealand\*\* and we guarantee to have you up and running again in 2 hours or less. Acer is the only PC vendor to offer this warranty.



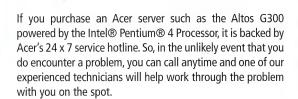
# I like to configure my own solutions.

It's easy to build your own computer with Acer. Simply go to www.acer.com.au, click on ShopAcer, and select the Acer product closest to your requirements. Then, choose from a range of options using the drop down menus to build the ideal customised solution for you. An on-line glossary explains each upgrade in plain English, so you can't go wrong. When you're finished, you can buy online, over the phone or save your configuration and take it to your nearest authorised dealer.



pentium

# My company needs back-up 24 x 7.



PEAUTHORITY

### **DIGITAL CAMERA**

## Minolta DiMAGE 7i

PRICE: \$1 999

SUPPLIER: Hagemeyer 1300 728 606

ISSUE: Labs Winner, June 2003, page 72

With a stylish and strong mag alloy-housed body, the Minolta 7i isn't budget, but at \$1,999 it produces beautiful and accurate results

PEAUTHORITY



### NOTEBOOK

# Dell Inspiron 8500

PRICE: \$4.599

SUPPLIER: Dell 1300 303 275

ISSUE: Recommended, April 2003, page 38

The inclusion of a GeForce4 4200 Go sweetens the deal considerably and helps this notebook redefine the term 'desktop replacement'. The Inspiron 8500 gets away with its bulky design thanks to strong performance.



# BUDGET NOTEBOOK

## ModTech Civic AS2400DW

PRICE: \$2 /499

PCAUTHORITY

PEAUTHORITY

SUPPLIER: ModTech (03) 9873 0068

ISSUE: Labs Winner, March 2003, page 38

An outstanding performer packed with excellent features with a desktop 2.4GHz Pentium 4 and DVD/CD-RW combo. drive it's not hard to see why it does so well. The price is nice ton



## 15-INCH TFT DISPLAY

# PolyView CMV 1515

PRICE: \$499

SUPPLIER: Impact Systems (02) 9621 25,

ISSUE: Excellence, June 2003, page 48

An exceptional display at an unbeatable price that's definitely worthy of consideration by the quality conscious or those on a tight budget



# 17-INCH TFT DISPLAY

## Samsung SyncMaster 172W

PRICE: \$1,499

SUPPLIER: Samsung (02) 9763 9700

ISSUE: Labs Winner, May 2003, page 71

The SyncMaster 172W took top honours is almost every category of our tests, and rated the highest of all monitors in this Labs. From such auspicious beginnings it's no surprise that we have awarded this widescreen monitor



# ATHLON MOTHERBOARD

# Gigabyte 7VAXP Ultra

**PRICE:** \$329

SUPPLIER: Synnex 1300 880 038

ISSUE: Labs Winner, July 2003, page 68

This board supports DDR400, a 333MHz FSB and has SATA and IDE RAID. It also offers six-channel audio with a full complement of I/O connectivity options, and the build



quality is excellent.

**PCAUTHORITY** 

# **CATEGORY** DISK UTILITY

> FIREWALL

MAGE EDITING

> ANTIVIRUS

**▶ WEB GRAPHICS** 

▶ WIRELESS CARD

# **PRODUCT**

# PartitionMagic 8

Fortress End Node VPN

Adobe Photoshop 7.0

Norton AntiVirus 2003

PRICE: \$149.95 SUPPLIER: Marketing Results (02) 9899 5888 ISSUE: Recommended, February 2003, page 53

**DETAILS** 

SUPPLIER: Fortress Networks (03) 9697 4444 ISSUE: Labs Winner. November 2002, page 98

PRICE: \$1,599 full package; \$349 upgrade; \$589 educational

SUPPLIER: Adobe 1300 550 305

ISSUE: Recommended, July 2002, page 61

PRICE: \$109.95 SUPPLIER: Symantec (02) 8879 1000

ISSUE: Labs Winner. October 2002. page 97

Macromedia Studio MX

SUPPLIER: Macromedia (03) 9855 3100 Issue: Recommended, November 2002, page 71

Booya BWSC23 PRICE: \$265

SUPPLIER: Booya (02) 9402 9888 ISSUE: Labs Winner, April 2003, page 67

> SOFTWARE ZoneAlarm Pro 3.5 PRICE: \$83 (US\$49.95) **FIREWALL** 

SUPPLIER: Zonel abs www.zonelabs.com ISSUE: Excellence, May 2003, page 58

# **VERDICT**

Simply the best partition utility on the market and an essential purchase for those who don't already have it. However, while version 8 adds some new features, there aren't enough to fully justify upgrading from version 7.

Out of all the firewalls we looked at, the Fortress End Node VPN came out on top. The attention to detail in its configuration options, the ability to micromanage all aspects of the firewall and the richness of its reporting engine were superb. A definite must-have for network security.

Yet again Adobe has replaced its predecessor with revolutionary, rather than evolutionary changes. With enhanced visual management, creative new brush handling and improved Web capabilities, Phototshop retains its title as the ultimate image editing program.

When it comes to antivirus, you not only need a top-performing product, but also one that is easy-touse, with frequent seamless updates and protection for a variety of possible entry points. Norton AntiVirus 2003 is the pick of the bunch with its excellent user friendly interface and top performance.

Studio MX not only offers great value for money, it's also easy-to-use and comes with a vast array of features. It's a design-focused Web-authoring suite that offers unparalleled functionality across the board and a welcome focus on open standards.

If you're looking for a wireless network card for you notebook, you need something with reliable performance and good compatability - and the Booya BWSC23 delivers.

The ultimate professional software firewall to protect your PC from all those would-be hackers. It's stable, scalable, easy-to-use and offers a truly amazing feature list for the price. Honestly, you can't go wrong.



# A-List: Upgrade guide

Welcome to the Upgrade guide. If you're looking to buy a PC, or perform an upgrade, use this page to set your yardsticks. We have put together specifications for three classes of systems, and broken them down into components and included rough pricing. Changes in hardware specifications and price each month are highlighted in bold text. Let us know how useful this page is to you, and what kinds of systems you want to see here - email:

## feedback@pcauthority.com.au.

#### BUDGET PC

#### **TARGET PRICE: \$2,000**

**TARGET PRICE: \$2,000** 

PRICE

COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Midi tower	300W+ PSU; 5+ bays; front USB	\$120
• CPU	AMD Athlon XP 2700+	2.17GHz; 256KB L2 cache;	\$279
		333MHz FSB	
<ul> <li>MOTHERBOARD</li> </ul>	VIA KT333 ATX	KT333 chipset; sound; ATA100	\$135
• RAM	512MB PC2700 DDR	333MHz DDR RAM	\$130
<ul> <li>GRAPHICS CARD</li> </ul>	NIVIDA GeForce Ti4200	AGP; 128MB DDR RAM	\$300
<ul><li>MONITOR</li></ul>	17in CRT	1,024 x 768 @ 85Hz minimum	\$229
<ul> <li>SOUND CARD</li> </ul>	Integrated sound	Integrated on motherboard	\$0
• SPEAKERS	2.1 stereo speakers	2 satellites; 1 sub-woofer; 33W+ RMS	\$99
<ul> <li>HARD DISK</li> </ul>	60GB IDE	7,200rpm; ATA/100; 2MB cache	\$179
<ul> <li>OPTICAL DRIVE</li> </ul>	CD-RW IDE	52 x 24 x 52 CD-RW	\$89
<ul> <li>FLOPPY DRIVE</li> </ul>	Floppy drive	1.44MB floppy	\$25
• MODEM	56K modem	V.90 internal PCI	\$40
• MOUSE	Basic mouse	Optical; 2-button; wheel; USB, PS/2	\$50
• KEYBOARD	Basic keyboard	104-key keyboard	\$30
• OPERATING SYSTEM	Windows XP	Home Edition	\$190
<ul> <li>PERIPHERALS</li> </ul>	N/A	None	\$0
<ul><li>WARRANTY</li></ul>	Standard	Three years RTB	\$0
Total			\$1,895

#### BUDGET PC

Representing the typical home PC, this is capable of performing a wide range of tasks. It's suitable for Web	system  OTHER 6%	SOUND 5%	GRAPHICS CARD	
surfing, office-based applications and playing most	RIPHERALS 6%			
games. It even includes a CD- MOTHERE 7% RW drive. Sporting a 56K	1000			STORAG
modem, you may wish to replace this with a PCI	7%			1576
Ethernet card for use with a broadband Internet service	SOFTWARE 10%		MONITOR	R
provider. This works out to about the same cost. Possible upgrades include		CPU 15%	12%	
forking out \$200 or so more for a 19in n		nd card		

about \$80 more for a DVD-ROM or better quality sound card.

## **BUSINESS PC** COMPONENT

PERIPHERALS

• WARRANTY

Total

DETAILS

COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Slim tower	Micro-ATX; 200W PSU; 2+ bays;	\$200
		tool-less access	
• CPU	Intel Pentium 4 2.4GHz	512KB L2 cache; 533MHz FSB	\$325
• MOTHERBOARD	Intel 845G	i845GE chipset; sound; LAN; ATA100	\$220
• RAM	512MB PC2700 DDR	333MHz DDR RAM	\$130
• GRAPHICS CARD	Integrated graphics	Integrated on motherboard	\$0
• MONITOR	17in CRT	1,024 x 768 ര 85Hz minimum	\$229
• SOUND CARD	Integrated sound	Integrated on motherboard	\$0
• SPEAKERS	N/A	None	\$0
• HARD DISK	40GB IDE	5,400rpm; ATA/100; 2MB cache	\$130
OPTICAL DRIVE	CD-ROM	52x CD-ROM	\$55
• FLOPPY DRIVE	N/A	None is the stable to the best in	\$0
• MODEM	N/A	None	\$0
• MOUSE	Basic mouse	Optical; 2-button; wheel; USB, PS/2	\$45
• KEYBOARD	Enhanced keyboard	Ergonomic or extra functions	\$120
• OPERATING SYSTEM	Windows XP	Professional Edition	\$290

TARGET SPECIFICATION

### **BUSINESS PC**

Here is a basic specification for a multipurpose business PC that would be suitable for many typical small to medium PERIPHERALS business tasks. Unlike the home PC, however, a business PC has some very different priorities. Performance is one of them, but more

OTHER SOFTWARE MONITOR STORAGE MOTHERBOARD important is reliability, serviceability and warranty.

OTHER RAM

CPU

As such, extra money has been spent on a slim and easily accessible case with a thorough same-day on-site warranty. This spec only represents the basic hardware, and doesn't include the two other major costs a business PC faces: software and services. Microsoft Office XP Standard alone will cost you almost \$1,000. Total cost of ownership is the mantra, and the initial hardware cost can only be around 25% of a PC's TCO over it's lifespan.

Enhanced

Three years on-site same-day

\$0

\$150

\$1,894

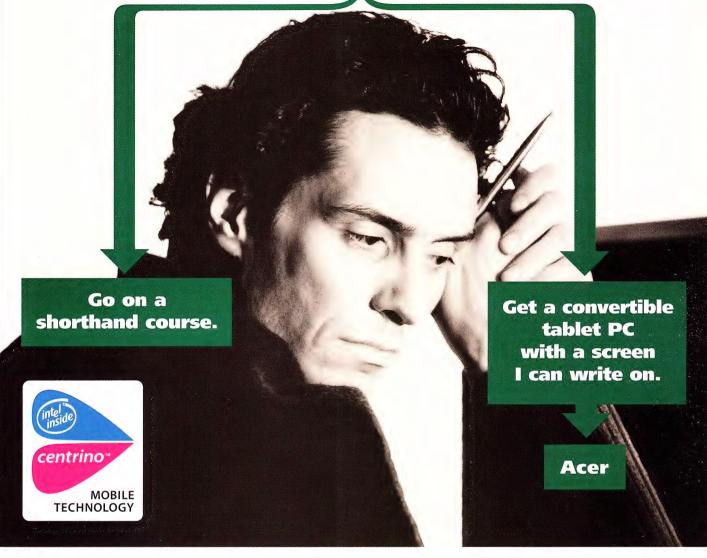
ENTERTAINMEN	NT PC	TARGET PRICE:	\$4,000
COMPONENT	DETAILS	TARGET SPECIFICATION	PRICE
• CASE	Midi tower	350W+ PSU; 5+ bays; front USB	\$150
• CPU	Intel Pentium 4 2.66GHz	512KB L2 cache; 533MHz FSB	\$520
<ul> <li>MOTHERBOARD</li> </ul>	Intel 845PE	i845PE chipset; LAN; ATA133 RAID	\$290
• RAM	512MB PC2700 DDR	333MHz DDR SDRAM	\$130
• GRAPHICS CARD	ATI RADEON 9800 PRO	AGP; 128MB DDR RAM	\$800
<ul><li>MONITOR</li></ul>	19in CRT	1,280 x 1,024 @ 85Hz minimum	\$400
<ul> <li>SOUND CARD</li> </ul>	PCI sound card	24-bit; 6.1 output; EAX	\$240
<ul> <li>SPEAKERS</li> </ul>	5.1 surround	5 satellites; 1 sub-woofer;	\$230
		45W+ RMS	
• HARD DISK	2x 40GB IDE RAID	7,200rpm; ATA/100 RAID; 2MB cache	\$300
<ul> <li>OPTICAL DRIVE</li> </ul>	CD-RW/DVD-ROM IDE	52 x 24 x 52 CD-RW; 16x DVD-ROM	\$170
<ul> <li>FLOPPY DRIVE</li> </ul>	Floppy drive	1.44MB floppy	\$25
<ul><li>MODEM</li></ul>	56K modem	V.90 internal PCI	\$40
• MOUSE	Optical mouse	Optical; wheel; USB	\$85
<ul> <li>KEYBOARD</li> </ul>	Enhanced keyboard	Ergonomic or extra functions	\$120
OPERATING SYSTEM	Windows XP	Professional Edition	\$290
<ul> <li>PERIPHERALS</li> </ul>	Game device	Joystick/gamepad/wheel	\$150
<ul> <li>WARRANTY</li> </ul>	Standard	Three years RTB	\$0
Total			\$3,940

#### ENTERTAINMENT PC

GRAPHICS This system represents a high-end PERIPHERALS gaming and entertainment PC at a SOFTWARE very reasonable price. With the Pentium 4, DDR RAM and RADEON 9800, it is about as MOTHERBOARD good as it gets gaming-wise at the moment. The DVD-ROM, sound MONITOR card and 5.1 channel surround speakers also make it fantastic for STORAGE SOUND multimedia. All the components are more than

adequate to the tasks at hand, while still offering full upgradeability. Further falling TFT prices mean you can pick up a 17in flat display for around \$300 more; upgrading the speakers will cost anywhere up to \$500 more. DVD burners are a fantastic option for bulk backup or home movies, but are a bit pricey - upgrading to a DVD writer will set you back \$450.

I'm forever rewriting my own scrawl from meetings.



You don't have time to rewrite your own rushed notes. So meet the first convertible tablet PC to feature Intel® Centrino™ mobile technology. With a simple 180 degree twist, Acer's TravelMate C110TCi transforms from notebook into slate, so you can write straight onto its 10.4″ colour screen and it will convert your handwriting into text. Dictate to your TravelMate and it will interpret your voice. And, weighing a mere 1.4kg, you can write on, type in and talk to the C110TCi anywhere - from busy trains to bumpy cabs. With advanced wireless functionality, you can also share data with colleagues while on the go. The TravelMate C110TCi has power for up to 6 hours\* use and comes with Acer's 2 hour service warranty\*\*. Get your Acer convertible tablet PC today. Your writer's cramp will thank you.





# Acer recommends Microsoft® Windows® XP Professional for Mobile Computing.

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\*Depending on configuration and usage.

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All-in-one Business Notebook

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BONUS CARRY CASE UPGRADE TO MICROSOFT® WINDOWS® XP PROFESSIONAL FOR \$150 RRP INC GST Mobile Intel® Celeron® Processor 2.2GHz 14.1" active colour screen 256MR DDR SDRAM 20GB hard disk drive 8 x DVD + 24 x 10 x 8 x CD-RW combo 1.44 floppy disk drive Internal 56K modem + broadband ready 10/100 LAN Microsoft® Windows® XP Home 2 Hour Commitment Warranty Express Service\*\*

RRP inc GST from \$20.03 per week\* Please quote e-Code TM2320

AcerPower ST

256MB DDR SDRAM

40GB hard disk drive

video applications)

Acer 17" monitor

Intel® Pentium® 4 Processor 2.6GHz

Microsoft® Windows® XP Professional

3 year limited (1 year on-site) warranty

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Altos G300

ONLY \$1,299 RRP INC GST

128MB ECC DDR RAM

52 x CD-ROM 300 watt power supply

48 x 24 x 48 x CD-RW + 16 x DVD combo drive Integrated AC '97 audio

Integrated 10/100M LAN - Broadband Internet ready

Ultra AGP II video technology (AGP 8x equivalent for 3D/2D

**Performance** 

ADD MICROSOFT® WINDOWS 2003 SERVER FOR

3 channel intergrated IDE controller Integrated Intel® Gigabit ethernet controller

3 year on-site warranty with 24 x 7 hotline support

Intel® Pentium® 4 Processor 2.4GHz

Dual Channel IDE RAID controller

and value server

Great value desktop

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15" LCD monitor

All-in-one

Notebook

TravelMate 284XC

UPGRADE TO MICROSOFT® WINDOWS® XP PROFESSIONAL

Mobile Intel® Pentium® 4 Processor 2.2GHz - M

1.44 floppy disk drive Internal 56K modem + broadband ready 10/100 LAN

2 Hour Commitment Warranty Express Service\*\*

BONUS CARRY CASE

FOR \$200 RRP INC GST

30GB hard disk drive

14.1" active colour screen 256MB DDR SDRAM

8 x DVD + 24 x 10 x 8 x CD-RW

Microsoft® Windows® XP Home

Performance

Great value desktop

# **AcerPower ST**

Intel® Pentium® 4 Processor 2.6GHz 256MB DDR SDRAM 40GB hard disk drive 52 x 24 x 52 x CD-RW Integrated AC '97 audio Integrated 10/100M LAN - Broadband Internet ready Ultra AGP II video technology (AGP 8x equivalent for 3D/2D video applications) Microsoft® Windows® XP Professional Acer 15" LCD monitor 3 year limited (1 year on-site) warranty

RRP inc GST from \$15.02 per week\* Please quote e-Code STB013

\$1,799

Rack optimised

performance server

Altos R300 ADD MICROSOFT® WINDOWS 2003 SERVER FOR

ONLY \$1,299 RRP INC GST Intel® Pentium® 4 Processor 2.4GHz 128MB ECC DDR RAM 1 x 40GB hard disk drive

2 x Integrated Intel® Gigabit ethernet controller 300 watt power supply 3 year on-site warranty with 24 x 7 hotline support

RRP inc GST from \$10.85 per week\* Please quote e-Code AAG3501

\$1,499

RRP inc GST from \$18.36 per week<sup>1</sup> ase quote e-Code AAR3502



Covertible Tablet PC with Intel® Centrino™ Mobile Technology

## TravelMate C110TCi

3 MONTH UNLIMITED BROADBAND WIRELESS ACCESS TO SKYNETGLOBAL® IN AUSTRALIA¹ Intel® Centrino™ mobile technology Intel® Pentium® M processor 900MHz Intel® 855GM Chipset Intel® PRO/Wireless Network Connection 802.11b 10.4" active colour rotatable screen 512MR DDR SDRAM 40GB hard disk drive External 8 x DVD + 24 x 10 x 8 x CD-RW combo Internal 56K modem + broadband ready 10/100 LAN Microsoft® Windows® XP Tablet PC Edition 2 Hour Commitment Warranty Express Service\*\*

RRP inc GST from \$33.39 per week\* Please quote e-Code TMC113



Top performance desktop

# Veriton 7600G

Intel® Pentium® 4 Processor with HT Technology 3.0GHz (800MHz FSB) 1024MB DDR400 SDRAM 120GB 7200rpm hard disk drive 48 x 24 x 48 x CD-RW + 16 x DVD combo drive Integrated AC '97 audio 3 piece desktop speakers (including sub-woofer) Integrated 10/100/1000 LAN - Broadband Internet ready 128MB GeForce FX5200 AGP 8x graphics card Microsoft® Windows® XP Professional Acer 17" monitor 3 year limited (1 year on-site) wárrantv

RRP inc GST from \$27.54 per week\* Please quote e-Code V7603



Maximum scalability server

# Altos G510

ADD MICROSOFT® WINDOWS 2003 SERVER FOR ONLY \$1,299 RRP INC GST Intel® Xeon™ Processor 2.4GHz Dual processor capable 128MB ECC DDR RAM 1 x 36GB Ultra 320 SCSI hard disk drive Integrated 10/100/1000 ethernet controller 54 x CD-ROM 1 x 450 watt hotswap power supply

3 year on-site warranty with  $24 \times 7$  hotline support

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\*\*Terms and conditions apply - warranty locations also available on website. See <u>www.acer.com.au</u> for full details. †Valid until 11 August 2003 or while stocks last. \*Rental amounts shown are indicative and based upon a 36-month rental contract and rates at time of publication; all state and federal government charges (Stamp Duty & GST) included. Rental figures quoted are for business use only and require a minimum purchase of \$2000 ex GST. All rentals are subject to credit approval. Provided by Acer Finance Australia Pty Ltd. Individual dealers may offer alternative financing options.

W5 Group ACE223/PCA



# REVIEWS

Darren Ellis brings you this month's selection of the latest hardware, software and reference titles.

# PERFORMANCE ENHANCING

It's not right in sport, and it's not right in the world of benchmarking. NVIDIA and ATI take heed.

n recent months there has been controversy over Futuremark's 3DMark03 benchmark and supposed cheating via driver patches from ATI and NVIDIA. 3DMark03 is the latest reliable set of 3D benchmarks from Futuremark (formally MadOnion) designed to sniff out the performance of video cards.

You'll be familiar with 3DMark2001Pro SE, a cornerstone benchmark in *PC Authority* testing, but as yet you won't have seen 3DMark03 scores in our pages. When launched in February, there were already questions about the level of involvement that ATI had in its development (a consulting partner to Futuremark), which meant there could be possible bias against NVIDIA.

Muddying these waters is the fact that this potential bias was highlighted by NVIDIA, even though it had pulled out from its consulting role months earlier at its own instigation. While this potential bias was totally unproven, I was a little uneasy to rely on this benchmark to test cards until these suspicions cleared.

In subsequent months it seems these fears may have been unfounded, but it's recently transpired that benchmark bias is being pushed from the other end—the card manufacturers. Recent NVIDIA driver updates meant that the graphics cards drivers detected that 3DMark03 was being run on a system, and it adjusted the card's performance to suit.

In some cases, NVIDA drivers output the 'same' visual quality as

'Graphics cards benchmarks tell you how worthwhile a graphics card is for running games, but thanks to NVIDIA and ATI all we now know is how good these cards are at 3DMark03.'

required by the benchmark but arrived at this result by a different avenue. To the layperson, the graphics displayed looked identical; but to the benchmark they were delivered quicker, with more efficiency and therefore awarded a better score. NVIDIA called this 'driver optimisation'. Futuremark and *PC Authority* call this cheating.

While you might concede that delivering the same quality more efficiently is to be applauded regardless of how it's done, when it comes to delivering these results only for a single benchmark and not for computer games then something's seriously wrong. NVIDIA's legalese bleating and protesting at Futuremark's indictment smacks of a child getting caught with their hand in the cookie jar.

Futuremark has been quite diligent and fair over the whole business. After checking driver codes and performance, and running a version of 3DMark03 without the identifiers the drivers use to detect the start of the benchmark, it saw a performance hit with NVIDIA cards in some of the tests. The result: a drop in the 3DMark03 score by around 24%. If you ask me that's more than just a little bit of 'optimisation'.

After checking NVIDIA's Detonator FX drivers Futuremark then turned to ATI's latest Catalyst drivers, and it transpires that ATI has also been dabbling in a bit of 3DMark03 finagling. It even admitted as much.

This whole thing has ignited a huge debate over 'driver optimisation' vs. 'driver cheating'. According to NVIDIA, all it did was optimise its drivers to increase performance. That's not bad, right? Maybe not, if you're NVIDIA, but remember that Ben Johnson was also 'optimised'.

Benchmarks do one thing only – perform the same, identical test across a variety of hardware to deliver a comparative score.

Graphics card benchmarks tell you how worthwhile a graphics card is for running games, but all we now know is how good these cards are at 3DMark03.

We're conducting a graphics card Labs next month, and will also be including a patched version of 3DMark03. This benchmark is fairly strong, and it strains a graphics card like no other benchmark I've seen, but remember to take all 3DMark03 results with a grain of salt. We sure will be.

DARREN ELLIS



WHAT'S HOT & WHAT'S NOT

@ HOT

ACER ASPIRE



O HOT

ADOBE ACROBAT 6.0 PROFESSIONAL

PDF like never before. Adobe delivers the goods.

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O HOT

PALM ZIRE 71

Palm has a new PDA out that's not quite a Tungsten and not quite a Zire. Page 50



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• We check out the beta of this award-winning backup and recovery software.

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A top gaming system, with all the trimmings. Page 45



Nine short *Matrix* movies animated by the top teams in their fields. Page 78

# RATINGS EXPLAINED

EXCELLENT .. 023456 VERY GOOD .. 12345 G00D ...... 0234 5 AVERAGE .... 020 4/5 POOR ..... 123488 DREADFUL ... 1 2 3 4 5 6

This product is also available on, or the hardware supports, Linux.

This product is also available on, or the hardware supports, the Macintosh platform.

This logo indicates the first full review published in Australia.

Only the best products get an award. But only the best of the best make the A-List.

More than just raw speed - how well does the product do its job?

Not just the quantity on offer, but are they up to scratch, and do innovative features deliver?

How good is the interface, documentation and training? Can you get up to speed quickly?

A balance of performance, quality and features compared to the price.

How in-depth is the subject matter? Is the product interesting and informative?

Is the product easy to access? Can you find whatever you need quickly?

A weighted and balanced collation of all the scores to give a final evaluation for the product.

### PEAUTHORITY: EXCELLISINGE

A product with no equal at the time. Either a technology

showcase or unrivalled quality for its time.



If you're buying, then any product with this stamp should most

definitely be on your shortlist.

# INTEL PENTIUM 4 3.2GHz (800MHz FSB)

# CPU

PRICE: \$1,300 est. SUPPLIER: Intel 1800 649 931 INTERNET: www.intel.com SPECIFICATIONS: Socket 478: 0.13-micron process; 512KB L2 cache; SSE2; 800MHz FSB; HyperThreading

**VERDICT:** Offering plenty in the performance department, Intel looks to have kept the upper hand in the ongoing CPU wars. Lots of bang here for the gamer's and processor intensive user's buck.

PERFORMANCE . 02905 FEATURES .... 02846 VALUE ...... 123 8 8 8 OVERALL ..... 02826

Mour PC is only as good as your last upgrade, and this is truer than ever with current gaming and software applications milking machines for everything they're worth.

Intel's latest offering to performance junkies is the 3.2GHz Pentium 4 processor with Hyper-Threading technology.

Designed for the Intel 865 and 875(P) chipsets (July 2003, page 62), the 3.2GHz features an 800MHz frontside bus (FSB), the benefits of which will only become fully apparent as clock speeds increase. As CPUs become faster, they will require quicker data transfer rates to avoid bottlenecking. This said, matching DDR RAM (DDR400) appropriately with an 800MHz FSB processor allows data to be transferred faster between the processor bus and the RAM allowing greater performance overall.

The introduction of revamped SiS 655FX and 648FX chipsets will be available soon as alternatives to Intel's 865/875 and will be validated for use with 800MHz FSB chips.

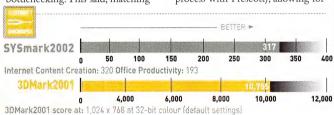
Following on from their previous success with the 3.06GHz Pentium 4. Intel has continued using the 0.13 micron fabrication process for this current chip (before moving to a 0.09 micron process with Prescott), allowing for

higher frequency and lower power

The 3GHz+ speeds of the latest Pentium 4 chips are really letting them show the potential of the architecture, and putting them ahead of the latest Athlon XP processors (July 2003, page 37). In SYSmark2002, the P4 3.2GHz managed to gain a 27 percent lead over the Athlon XP 3200+.

Early adopters and upgraders with a decent amount to spend are in for a pleasant performance surprise with the 800MHz frontside bus, although finding a matching pair of JEDEC approved DDR RAM sticks may prove to be your biggest problem.

Dan Chiappini



# XENON ATOMIC 675X

# MULTIMEDIA PC

PRICE: \$4,599 **SUPPLIER:** Xenon Systems 1300 888 030

INTERNET: www.xenon.com.au SPECIFICATIONS: 3.0GHz Pentium 4; 800MHz FSB; 80GB SATA hard disk; 1GB DDR400 RAM; 8x USB; 52 x 24 x 52 CD-RW; DVD-ROM; 17in LCD; 128MB RADEON 9700 PRO; Creative Audigy Digital Entertainment; Gigabit Ethernet; Windows XP Professional. Two-year warranty

VERDICT: A great performer with plenty of potential for the entertainment PC crowd.

PERFORMANCE . 02000 FEATURES .... 0284 VALUE ...... 1234 8 6 OVERALL ..... 0234 8 8

he first thing that catches your eye upon unpacking this PC is the black anodised case with custom stealth drive face plates. Its front USB and audio connectivity keep you from fumbling around for common rear-mounted ports, and the inclusion of thumb-screws makes for easy access to the chassis.

It's inside that you find a HyperThreaded Pentium 4 3GHz processor with an 800MHz FSB, plus a gig of DDR400 RAM in dual-channel configuration. All the hallmarks of a tricked-out gaming machine, ready to chew through new games and applications.

Given the improvements in

years it was good to see Xenon has supplied a 17in Hyundai display with the package. It's easy on the eves, has a decent pixel response and reasonable tilt adjustment levels - great in conjunction with the bundled RADEON 9700 PRO that rounds off the graphics element nicely.

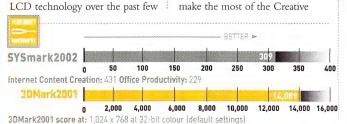
Also included in the package is a Microsoft six-button game controller and a set of two-piece Altec Lansing speakers, which lack a little given the extravagance and intended purpose of the entertainment system - it would have been nice to see a three or five piece speaker system to really make the most of the Creative

Audigy card.

Performing admirably in the benchmarking, it returned an impressive overall SYSmark2002 score of 309 - the combined effort of the increased FSB as well as dual-channel DDR RAM.

3DMark2001SE Pro again allowed the system to shine, boasting an impressive 14,089, just the sorts of figures you want to see in a high spec entertainment platform, although the 9800 PRO in the Emagen (next page) squarely beats it. Given it's also a little more expensive than the Emagen, and lacks some extra features like RAID, it's not as good value, but it's still a very impressive entertainment PC none the less.

Dan Chiappini.



# HP PAVILION t134a

# HOME PC

PRICE: \$2,999
SUPPLIER: HP 13 13 47
INTERNET: www.hp.com.au
SPECIFICATIONS: Pentium 4
2.53GHz; 512MB RAM; 120GB
HD; GeForce MX440 128MB;
17in CRT; CD-RW/DVD; 10/100
Ethernet; 56K modem; 3
FireWire, 6 USB 2.0 ports;
CF/SM/MMC/SD/Memory Stick
slot; WinXP Home; software
bundle. Includes HP PSC 2110
All-in-one

VERDICT: Powerful and well rounded PC for home users, with good specs massive software bundle – and includes a MFD to boot.

ooking sleek and a little smaller than your average midi tower, the t134a sits on top of the Pavilion series. This machine is a powerful home/office PC – not rigged purely for gaming.

Its 2.53GHz Pentium 4 and 512MB RAM, huge 120GB hard drive capacity and 128MB of video memory describe a very formidable and competitive spec. A CD-RW/DVD combo, Dolby 5.1 integrated audio, LAN, modem, USB and FireWire connectivity and cordless peripherals contribute towards making this a well-rounded PC for modern home use.

These are not the only

highlights of this PC. If you pop down the moveable panel at the front of the box, you will see not only a USB and a FireWire port, but six card reader slots. This six-in-one digital media reader occupies a 3.5in drive bay and supports CompactFlash, SmartMedia, Multimedia Card, Secure Digital and Memory Stick.

What's even more attractive is the huge bundle of software that accompanies the base Windows XP Home installation. HP offers some software for all fronts, ranging from MS Works 7.0, MS Money for office productivity, Encarta 2003 for education, as well as digital imaging software,

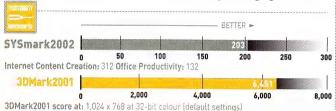
tal Norton Antivirus 2003 and a

Norton Antivirus 2003 and a range of recovery tools.

It is easy to connect devices externally, but after popping the hood (no tools required), expanding it on the inside will prove more difficult. Only two DIMMs are available, which are both used. Moreover, there will not be much room for expansion cards either – of the three PCI slots offered only two are free.

Finally, it is worth mentioning that for \$2,999 the t134a ships with the HP PSC2110 All-in-one printer/scanner/copier, making an ideal addition to a powerful family or office computer.

Nirmal Chandrasena



# **EMAGEN VITESSE P4**

# GAMING PC

**PRICE:** \$4,399 **SUPPLIER:** Emagen 1300 880 070

INTERNET: www.emagen.com.au SPECIFICATIONS: Pentium 4C 3GHz; 1GB DDR400; 2x Seagate Barracuda 80GB SATA HDD in RAIDO; i875 chipset; RADEON 9800 PRO 128MB; Samsung SyncMaster 17in TFT; 16x DVD-ROM; 52 x 24 x 52 CD-RW; 8 USB 2.0, 1 FireWire ports; SB Audigy; Creative Inspire 4400 speakers; Gigabit Ethernet; Logitech cordless keys/mouse. WinXP Home; software bundle

**VERDICT:** Phenomenally powerful gaming machine, but you pay for the privilege.

f you're looking for a computer geared for gaming, the Vitesse is it. If you think that a Pentium 4C rumbling at 3GHz with a massive 1GB of DDR400 RAM has a nice ring to it, its gamers'-poetry when you add in a RADEON 9800 PRO.

Big games need big space, so, the Vitesse comes with 160GB of SATA capacity working in RAID0 – thus, access times should not be a concern. If you're worried that you'll run out of space, a Lite-On CD-RW is on standby to provide backup capability. All this is wired by the latest Intel chipset – the 875.

The system looks great running anything, and although it will capture you with the visuals, it makes no concessions with sound. The Sound
Blaster Audigy card is
kept company by a
Creative Inspire 4400
4.1 speaker system.
The surround sound
should definitely help
if, for some strange
reason, you decide to take a
break from gaming and watch
some DVDs.

The bundled Logitech Cordless keyboard and mouse will do away with cables, and if you ever feel that cordless gaming is not for you, you may opt to use one of the eight USB 2.0 ports (two front, six back) for any gaming peripherals of your choice. Also, the 17in Samsung SyncMaster is thin enough to tuck away wherever you want it,

and big enough to stand out when you need it to. While we're talking about dimensions, another interesting fact to note is the

midi tower. It's fitted out with a Perspex side, internal neon lights, and tooless entry, and considering all this extra gear, it is extraordinarily light.

Performance in 3D is

Performance in 3D is blistering, as expected, although we had some problems getting SYSmark2002 to finish the tests.

The Vitesse is a package to gloat over if you it own, and be jealous of if you don't. It offers some serious firepower for users who like to drool over games alone, and to play games together.

Nirmal Chandrasena





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# **ACER ASPIRE 1703SC**



# DESKNOTE

PRICE: \$2,999 SUPPLIER: Acer 1300 366 567 INTERNET: www.acer.com.au SPECIFICATIONS: 2.66GHz

Pentium 4; 256MB RAM; 80GB 5,400rpm hard disk; 17in LCD, 1,280 x 1,024 resolution; SiS M650 graphics; DVD/CD-RW; PCMCIA Type II; stereo speakers with subwoofer; Windows XP Home; and a one-year warranty. Weight: 6.4kg

VERDICT: Huge. Heavy. Excellent. The Aspire 1703SC is a big beast, but it perfectly fills a growing market niche.

PERFORMANCE. 00000 FEATURES ... 00000 S
VALUE ...... 000000 OVERALL .... 0000000



This is not the first 'desknote' that we've reviewed (see Protac DeskNote, June 2002, page

*37*) but in our estimation the Aspire 1703SC is the first system that truly expounds the virtues of true desknote-ism.

A desknote is part notebook, part desktop but not quite either. They're notebook-like in that they feature much of the same design and aesthetics as notebooks (and sometimes share hardware), but desktop-like in that they're more powerful than a notebook and lack batteries, requiring mains electricity to run. This means that a desknote is a portable desktop.

Where the Protac DeskNote

was a really chunky notebook without a battery, the Aspire 1703SC is, well, huge. You certainly couldn't get away with a 17in TFT panel in a portable at the moment, but in a desknote it suits perfectly.

Inside, the unit has a 2.66GHz Pentium 4 with 256MB of RAM (although 64MB of this is shared with the video), an 80GB hard drive, a DVD/CD-RW combo drive and SiS M650 graphics. With this base configuration the unit was unable to ace the 3DMark2001 SE Pro test, with a score of 1,081, but it did passably in SYSmark2002 proving to be capable of some business nous.

Plenty of configuration options are available or coming

ut ctly.

66GHz soon however, so f

soon however, so you can up the ante to, at press time, a 3.06GHz P4, 1GB RAM, 120GB HD, and NVIDIA GeForce4 448 Go graphics. Coming soon are NVIDIA FX 5600 and 5900 cards, although these are specially built and not off-the-shelf jobs. This said, the base configuration is priced at only \$2,999 and is user upgradeable in part (such as CPU and hard drive).

The Aspire 1703SC is a groundbreaking machine. The 17in display looks gorgeous, and it's a delight to use for work and play – even if it's too heavy to be truly portable.

Darren Ellis

# SYSmark2002 202 200 250 300 Internet Content Creation: 293 Office Productivity: 139

# TWINHEAD EFIO! 2B18 PTK

# NOTEBOOK

PRICE: \$2,299

SUPPLIER: Twinhead
(03) 9375 3545
INTERNET:
www.twinhead.com.au
SPECIFICATIONS: 1.8GHz
Pentium 4-M; 384MB RAM;
40GB hard disk; DVD/CD-RW
drive; S3 ProSavageDDR 32MB
(shared); 15-pin D-Sub and SVideo out; IRDA; 10/100
Ethernet; PCMCIA Type II slot;
stereo speakers; Windows XP
Home. Weight: 2.73kg

VERDICT: It's not the most rugged design, but the Efio! 2B18 PTK offers solid specifications and some useful frills for entertainment.

 he Twinhead Efio! 2B18
PTK gives the impression
of a modern, sporty and
sleek notebook. It's powered by a
Pentium 4-M processor running
at 1.8GHz, and carries 384MB
memory and a 40GB hard drive.
These core specifications
describe a reasonably powerful
portable capable of taking the
strain of daily office productivity
tasks. This is shown by the fairly
strong SYSmark score, although
it's not the fastest notebook
we've seen.

Complementing its ability to play DVDs on the TFT, the 2B18 PTK also offers an S-Video port so that you can enjoy your movies on a television.

The notebook offers a moderate level of connectivity, including a 56K modem, 10/100

Ethernet and Type II PCMCIA. There are also three USB 2.0 ports spread across both sides of the chassis, which is a nice touch. If you wanted to use an external keyboard and mouse, you'd have to use the USB interface as there are no PS/2 ports.

The unit has a slim chassis, and its metallic silver colour and rounded-edge design contribute to a fashionable look. There are also four TrackPad buttons, two of them installed on a 'rocking' button that is configurable and can be used as a scrolling system. The keyboard is 'spillproof' and should provide some degree of protection against any coffeerelated accidents. The actual build quality of the chassis is, however, another matter. We

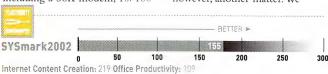


the TrackPad buttons would bend inward when a little extra pressure is applied, and the combo-drive tray felt fragile.

At its core, the Twinhead Efio! 2B18 PTK features some good specifications. It has a fast processor and can handle the typical workload expected of most notebooks. Its sleek and modern design should also turn heads. Weighing in at 2.73kg the notebook is slightly heavier than it looks.

Overall it's a slick, well-priced portable with balanced features but not terribly rugged.

Nirmal Chandrasena



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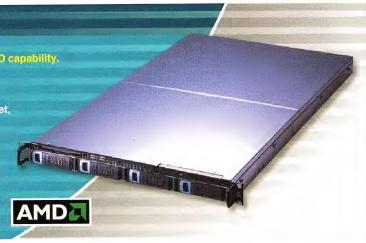
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- Adaptec 2010S Zero Channel RAID 0,1,5 Controller.
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Dual Intel Xeon processor configuration also available.



# **2U MAXTRON SERVER 214**

Highly Scalable Dual Intel Xeon Server for Mission Critical Applications.

- 400W Power Supply (Optional Redundant Power Supply).
   Dual Intel Xeon 2.8GHz CPU
- Tvan Thunder i7501 S2721UGN Server Board, Intel E7501 Chipset, Adaptec U320 SCSI Controller, 4MB Graphic, Dual Intel LAN (Gigabit + 10/100M)
- Adaptec 2010S Zero Channel RAID 0,1,5 Controller.
- 4GB ECC Registered DDR RAM(support up to 12GB ECC Registered DDR RAM).
- 6 x 73GB SCSI SCA Hot Swappable HDD.
- Black CD-ROM/DVD & FDD.

Dual AMD Athlon MP processor configuration also available.



# **PEDESTAL MAXTRON SERVER 103**

# Powerful Small to Medium Business Server.

- 460W EPS12V Power Supply (Optional Redundant Power Supply).
- Dual Intel Xeon 2.8GHz CPU.
- Tyan Tiger i7501 S2723GNN Server Board, Intel E7501 Chipset 533/400MHz FSB, 8MB Video, Dual Intel LAN(Gigabit + 10/100M) on board.
- Adaptec 2010S RAID 0,1,5 Controller.
- 8GB ECC Registered DDR RAM.
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Dual AMD Athlon MP processor configuration also available.







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# TOSHIBA E750 WITH WiFi

## PDA

PRICE: \$1,299 WiFi; \$1,249 BlueTooth SUPPLIER: Toshiba 13 30 70 INTERNET: www.isd.toshiba.com.au **SPECIFICATIONS: 400MHz** Intel PXA255; 64MB RAM;

32MB ROM; SD/MMC slot; Type II CF; 240 x 320 transreflective TFT; Outlook 2000: Pocket PC 2002 OS: USB cradle. Dimensions: 79 x 16 x 124mm (W x D x H). Weight: 191g

**VERDICT:** With power and flexibility in abundance, only the high price counts against the e750 WiFi.

QUALITY ..... 0234 5 6 FEATURES .... 023456 VALUE ...... 123 4 5 6 OVERALL ..... 02826

he Toshiba e740 (review on the PC Authority Web site) boasted great features such as Type II CF and SD/MMC card slots, and the optional expansion pack which includes a VGA output and USB port, allowing the connection of a keyboard and a projector. The e750 goes two steps further. You can now send 16-bit colour to a projector at a resolution of 800 x 600, and this WiFi version connects wirelessly to a suitably equipped Toshiba projector.

Another WiFi enhancement is support for Voice-over-IP with an enhanced microphone socket so a microphone headset can be used.

Toshiba hasn't made any serious changes to the chassis, unless you count slightly modified front buttons, so all the e740's peripherals work with the e750.

The only notable physical change is the 3.8in trans-reflective screen as opposed to the 3.5in screen in the e740. The extra 0.3in

won't make a huge difference in general use, but the new screen's rich colours and bright backlighting shouldn't be ignored.

There are quite a few changes underneath the surface too. The 400MHz PXA250 processor has been 'upgraded' to the 400MHz PXA255, promising performance increases of up to 40 percent but in general use the changes were barely noticeable.

Intel claims the new processor will also extend battery life, but this is only notable if you drop the speed from 400MHz to 200MHz. Unfortunately, it doesn't have the option to change automatically depending on the demands of the current task (unlike Dell's Axim X5 – reviewed on the PCA site). Still, it lasted for more than three hours over three days, and with the ability to charge directly from the PSU plus optional extended life

This PDA should attract plenty of corporate attention.

battery, this won't be a problem.

Another bonus is the extra 32MB of flash memory included. This means you should never lose all your vital data.

With 64MB of 'normal' RAM included as well, there's a fair amount of storage for additional apps and data.

The e750 WiFi offers a number of excellent improvements on the e740, but it's a shame Toshiba doesn't include the expansion pack as standard – at this price, we expect a little more in the box, and Toshiba should make more of this unique feature. Also, bear in mind HP's iPAQ H5450 (reviewed on the PCA site) costs about \$1,499 and includes Bluetooth, WiFi and fingerprint-recognition security. Perhaps more tellingly still, Dell's Axim X5 costs a mere \$591.

**Tim Danton** 

# TOSHIBA E350

#### PDA

PRICE: \$649 SUPPLIER: Toshiba 13 30 70 INTERNET:

www.isd.toshiba.com.au SPECIFICATIONS: 300MHz Intel PXA255 processor; 64MB RAM; 16MB ROM; SD/MMC slot; 240 x 320 trans-reflective TFT (54 x 71mml: USB docking station/recharger: Outlook 2000: Pocket PC 2002 Premium Edition OS. Dimensions: 80 x 12.4 x 125mm. Weight: 150g

VERDICT: Not as fast as the Dell Axim X5, the e350 offers a good compromise in terms of size, cost and performance.

QUALITY ..... 02846 6 FEATURES .... 02046 VALUE ..... 0234 5 6 OVERALL ..... 02336

oshiba's PDA strategy is clear: business users should opt for the larger, more flexible e750 (above), while consumers are catered for by the e350. After all, this has all the features most people need in a sleek package that won't break the bank.

The e350 is an update to the e330 (review on the PC Authority Web site), with the processor upgraded to Intel's 300MHz PXA255. Unfortunately, however, while Toshiba has kept RAM at 64MB, it has halved the Flash ROM to 16MB. This means the OS is slightly cut down, so for instance, Pocket Word doesn't include a spell checker, and apps like Media Player must be stored in RAM.

At 12.4mm thick, it is easy to work with and comfortable to hold. Toshiba has wisely used the extra height to include a jog dial. Also bundled is a

protective slipcase and USB docking cradle.

Naturally, this basic Pocket PC doesn't include advanced features like Bluetooth, but there's room for additions via the SD/MMC slot, and an ever-present

infrared port. There's also a headphone jack, but Toshiba doesn't include any earphones as standard.

Over a few days, the battery lasted for three and a quarter hours, reasonable for those who use their PDAs mainly for reading emails, perusing AvantGo and playing games. Unfortunately, the battery isn't removable, which could cause problems in the future.

While the e350 is certainly a usable all-rounder, there are alternatives. HP's iPAQ H1910 is



significantly smaller and has a far more vivid

Then there's Dell's Axim X5 (reviewed on the PCA site), offering better

performance and features at a very similar price, but it's bulkier than the e350.

Then again, not everyone needs a CompactFlash slot or a 400MHz processor - I found the e350 flew along in general use. Plus, the e350 slips into a pocket, even with the protective slipcase in place. It adds up to a respectable compromise in terms of features, performance and bulk, and it's undeniably a tempting proposition to consider.

**Nick Ross** 

# **PALM ZIRE 71**

# PDA

PRICE: \$599 SUPPLIER: Palm INTERNET:

www.palm.com.au SPECIFICATIONS: 144MHz TI OMAP 1510 processor; 16MB RAM; SD/MMC slot; 320 x 320 trans-reflective TFT (54 x 54mm); USB docking station/recharger; Palm Desktop, and Palm OS 5.2. Dimensions: 73 x 16.5 x 113mm. Weight: 148g

**VERDICT:** The Zire 71 successfully infiltrates the Sony CLIÉ's territory, with an integrated digital camera and MP3 player on offer, all for a very reasonable price.

QUALITY ..... 02346 FEATURES .... 02845 VALUE ...... 028466 OVERALL ..... 02345



The Zire 71 isn't a business tool. It's not even a straight forward personal organiser. Palm is targeting

the ears of Sony's CLIÉ range, the new PDA boasts not only a headphone jack for MP3 player use, but also a 640 x 480 camera.

The camera is ingeniously hidden behind the metal backplate. To activate, you simply slide down the backplate to reveal the lens, the screen becoming a viewfinder. You can save photos to the memory - 12.7MB before you start loading programs - or to an SD/MMC card that slips into the top-mounted slot.

Upon synchronising with your PC, the photos can automatically be placed in a folder on the hard disk. Don't expect phenomenal results, though. Colours are washed out and, not surprisingly, the lack of flash is limiting. Still, the results are fine for emailing

and now, of course, you'll always have a camera with you.

The inevitable drawback is size, the Zire 71 weighs 148g and is 16.5mm deep - gone are the days of the sleek Vx. To protect the screen, you'll need to use the case, adding a further 10mm to the bulk and bringing the weight to 191g.

Mind you, the screen is worth protecting. Its 320 x 320 pixels are brightly lit and text is easy to read. With a 16-bit specification, we hoped colours would look natural, but it struggles with skin tones. This was again true when playing back video, but at least there were no dropped frames.

There are also some other imperfections. The stylus feels cheap and doesn't fit the reset button. Also, there's no light to indicate whether it's charging or not, sometimes losing connection with the docking cradle so you think it's charging when it isn't. Finally, the five-



The Zire 71 can be an MP3 player and digital camera thanks to its neat design.

way navigator is a little fiddly.

But, in Palm's defence, it does includes a docking station, and let's not forget the aggressive price - Sony take note. With solid battery life in our tests, lasting for almost four hours over several days, the Zire 71 is one extremely attractive PDA.

Tim Danton

# **D-LINK DSL-604+ WIRELESS ADSL ROUTER**

# WIRELESS ADSL ROUTER

PRICE: \$699.95 **SUPPLIER: D-Link** (02) 8899 1800 INTERNET:

www.dlink.com.au

SPECIFICATIONS: ADSL Router with four 10/100Mb/s switching LAN ports; 8Mb/s upstream and 1Mb/s downstream; 802.11b wireless access point with 300-metre range and 256-bit WEP encryption

VERDICT: Once you get around the poor installation instructions you will wonder why you never got one before.

QUALITY ..... 02826 FEATURES .... 020 VALUE ...... 02345 OVERALL ..... 0284

elstra savs it now has more than 300,000 ADSL subscribers and is on target to reach a million by 2005. The problem with home ADSL is that unlike cable. Telstra doesn't make it easy to network even though it requires an Ethernet connection. Interestingly, the Ethernet requirement for broadband Internet connectivity is also helping to drive the rising popularity of home networks.

The problem with most home networks is that they rely on an Ethernet hub or switch and require several metres of cable, which at the very least looks messy and can become a hazard in heavy traffic areas where people are likely to trip over it.

D-Link has provided a solution with its DSL-604+ Wireless ADSL router and to be fair, it is aimed more at small businesses than the home users. However, it is just priced low enough to attract anyone who

has a few PCs or even a PC and a wireless-enabled laptop who wants to share their ADSL connection.

The beauty of the 604 is that it will cope with a reasonable size combination network as it has four Ethernet ports as well as the 802.11b wireless LAN.

Setting up the initial connection to the computer that is going to act as your 'server' is not helped by the quick installation or the manual (which is on CD).

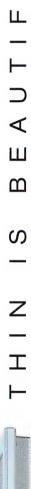
While it doesn't require any software and uses your Web browser for its management interface, the instructions for setting up your network sometimes bear little resemblance to reality and that can be a major problem for any network novice.

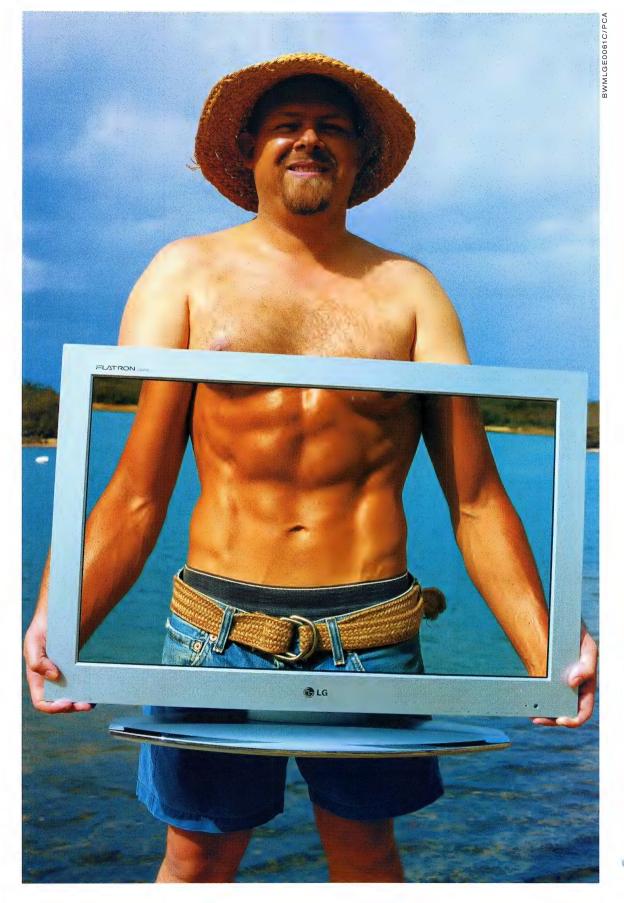
However, if you've set up a network before you can work

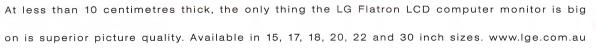


out the gist of what you're supposed to be doing and take it from there. Like many other wireless devices, connectivity initially can be a hit or miss affair. However, once you've mastered it the 604 goes from being a nightmare to your best friend and you will wonder what all of the initial sweating and swearing was about, and why you didn't set up a wireless network earlier.

**David Hellaby** 











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# **INFOCUS LP650**

# DATA PROJECTOR

PRICE: \$9,999
SUPPLIER: Electroboard
1800 622 800

INTERNET

www.electroboard.com.au **SPECIFICATIONS:** DLP projector; 2,500 ANSI lumens; 800:1 contrast ratio; throw

800:1 contrast ratio; throw distance 1.5-10m; image size 0.7-6.7m diagonal; M1D/A, RGB D-Sub, S-Video, and RCA composite. Dimensions: 11 x 35.1 x 32.5cm, 4.24kg

**VERDICT:** A top-end projector for the corporation or your business' bright boardroom.

e've been impressed with InFocus' low-priced video/data projectors in the past (review on the *PC Authority* Web site), and were keen to see what one of its fully-featured data projectors was capable of. Costing \$9,999, this is certainly not what one would consider a budget option, so what can this kind of money net you for the boardroom?

The biggest differentiator with this projector is its applicability for many installation situations. As well as supporting roof mounting it is capable of projecting a very decent sized image from a 10-metre throw distance.

Additionally, the LP650 comes with a massive 2,500 ANSI lumens rating. This means the projector is well suited to almost all areas where ambient lighting is an issue, and its projected images can be seen in all but direct sunlight. A convenient whisper mode allows you to toggle this down to 2,000

ANSI lumens where the ambient lighting is not a problem.

The unit has a native XGA resolution (1,025 x 768), and looks fantastic and sharp when projecting RGB. It has a manual zoom ring which lets you enlarge the projection by around 40%, and comes with manual focus.

As a data projector we could not fault the LP650. It has plenty of connectivity options, a whopping 800:1 contrast ratio (which really lets you configure the image), black blacks, and is reasonably quiet and cool to run.

Although it's not explicitly designed to project video, the LP650 does come with Faroudja Technologies DCDi video processing technology which helps smooth out frames in video. We did find that if you want to use this projector for video you have

①2,500 ANSI lumens within – that's extremely bright.

to accept a certain level of jaggies in fast motion frames and the occasional colour mis-registration, particularly in high-contrast areas in panning shots.

There's not much wrong with this the InFocus LP650, although at \$9,999 you have to decide if it fits your needs in regard to the projection environment, otherwise you might be better served by a unit with lower ANSI lumens ratings and pricing.

Darren Ellis

# **REALMAGIC XCARD**

# HOME A/V

INTERNET:

PRICE: \$299 SUPPLIER: Pineapplehead 1800 657 601

www.pineapplehead.com.au SPECIFICATIONS: Plays DVD, Superbit DVD, SVCD and VCD 1.x, 2.0; supports DivX, MPEG-4, MPEG-2 and MPEG-1; NTSC/PAL conversion; 4:3, 16:9, letterbox and pan and scan modes; composite and S-Video output; stereo audio out; S/PDIF digital audio out;

**VERDICT:** Does everything it says it will – if you don't mind having wires everywhere.

IR remote control included

EASE OF USE ... 0 20 4 5 5 FEATURES ... 0 20 4 5 5 5 VALUE ..... 0 20 4 5 5 5

he idea of using your PC as the central control point for your home theatre has been bandied about for some time. You can do it with a standard graphics card with video output and your sound card, but the Xcard offers an all-in-one product with some extra features to boot.

The Xcard is basically a multimedia card that uses your PC as the primary source of media. You can play DVD and VCD movies as well as MPEG4, or even DivX clips, and MP3 files too. It will convert a variety of formats for display on standard or high definition television sets as well as VGA monitors in either 4:3 or 16:9 format with letterbox and pan and scan supported.

The card also can be connected to external Dolby surround sound systems, all controllable from the Xmedia player interface.

Installing the card is not difficult. It takes just a few minutes to fit it into an available PCI slot and link it to your graphics card and VGA monitor. However, there were some issues with uninstalling it and it conflicting with Norton Internet Security.

Once you have it up and running you can run your DVD audio through your external surround sound system rather than relying on your suspect TV speakers. If have a library of movies on your hard drive, or want to hear your MP3s blasting out of from your home theatre sound system, this is the way to do it.

The card also has connections for Dolby Pro Logic and Dolby Digital Surround Sound systems.

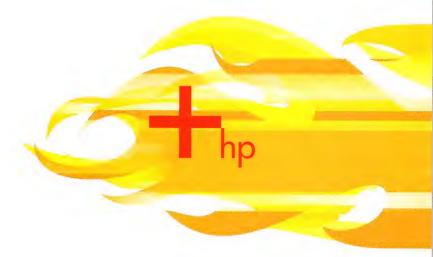
And you don't have to sit at the computer to operate it all as there is an infrared remote f you can work around the cables, the Xcard is a solid buy.

control system, consisting of a base that makes use of your serial port, and a handheld remote.

Xcard does what it sets out to do and turns your PC into a home theatre PC (providing you have all the extras such as a sound system, TV and DVD player). It also gives you a taste of what it would be like to have everything controlled from a central point and how much better your MP3 will sound played through some proper audio equipment.

**David Hellaby** 





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# ADS TECHNOLOGIES PYRO A/V LINK



# VIDEO CONVERSION

PRICE: \$693 SUPPLIER: CoNeXuS (02) 9975 2799 INTERNET:

www.conexus.com.au

**SPECIFICATIONS: RCA** 

composite, S-Video and four-pin FireWire inputs; RCA composite, S-Video, RCA component and FireWire outputs: MPEG2, PAL. NTSC. PC requires: PIII 400MHz: FireWire: and Windows 98/ME/ 2000/XP. Mac requires: FireWire-enabled iMac, iBook or G4; and OS 9x, OS 10, OSx Jaguar.

VERDICT: A small box with some great DV smarts.

QUALITY ..... 0234 3 6 FEATURES .... 1234 8 8 VALUE ..... 1234 OVERALL ..... 0234 5 0

igital video is a rising star, with DV camera sales increasing from year to year and digital software sales to consumers and enthusiasts alike also on the rise. It's a welcome trend, to be sure, but with all such trends there is a widening gap between the digital haves and the have-nots, with no easy way to share video between.

Enter the Pyro A/V Link from ADS Technologies. This handy box is similar to the Canopus ADVC100 (review on the PC Authority Web site) in that it's an analog/digital video converter. With a wealth of connections. the small box is capable of capturing both PAL and NTSC analog streams, and converting them to DV or vice versa.

With RCA composite, S-Video and four-pin FireWire inputs on the front, and RCA composite, S-Video, RCA component, and FireWire outputs on the back, the Pyro A/V Link allows you to plug in a wide variety of analog and digital sources for transcoding and recording.

A series of DIP switches on the back routes the video accordingly, preventing accidental transcoding of the wrong video. We tested the box with a variety of video streams including analog from a VCR and DV streamed from a PC and it was able to produce good end results with clear framerates and picture quality.

More than just a transcoder in a box, the Pyro A/V Link's outputs can be used to transcode video on the fly for display on a TV or projector. The display outputs can also be used to preview video as you transcode.

The unit supports both PAL (720 x 576, 25fps) and NTSC

Not much to look at, but there's plenty of connection options.

(720 x 480, 30fps) analog video. and MPEG2 digital video (with 32, 44.1 and 48kHz, 12 and 16-bit audio). About the only thing it can't do is convert analog PAL/NTSC streams for analog recoding.

The Pyro A/V Link is fairly simple to set up and use, with the only problem being the mess of cabling to and from the box.

**Darren Ellis** 

# PINNACLE PCTV DELUXE TV CARD

# TV CARD

PRICE: \$510 SUPPLIER: Pineapplehead 1800 657 601 INTERNET:

www.pineapplehead.com.au SPECIFICATIONS: USB 1.1 and 2.0 interface; composite and S-Video input; stereo audio input; TV antenna. Requires: 700MHz Pentium III; 128MB RAM; graphics controller with DirectX 8 support; CD-RW or DVD-RW drive; and Windows ME/2000/XP

VERDICT: More useful for its video capture and DVD burning capabilities than watching tele.

EASE OF USE .. 1284 . 0 FEATURES .... 0230 8 8 VALUE ..... 023 ... OVERALL ..... 0234 5 1

ver since the mid-1990s, a wariety of manufacturers have been attempting to find a reliable way to turn your PC into a television - without a huge amount of success.

TV is particularly resource hungry, which means that even with the most up-to-date video card you're not going to get a great full screen image. And besides that, most people actually find it a little distracting watching television while they are working.

However, the new PC/TV devices now have more useful functions such as video capture from digital cameras, DVD burning capabilities and even video recording and realtime recording in MPEG1 and MPEG2 formats.

Because it's an external device, it is easy to connect and simple to set up, however, it's essential to make sure you don't have any software already loaded that may

conflict, including other DVD burners or applications associated with your graphics card.

As long as your PC is within reach of a TV antenna or cable television connection you can be watching TV while you work in a matter of minutes.

PCTV will do an automatic channel search and comes with a remote control unit that allows you to channel surf as if you were in front of your lounge room TV. However, in most cases your picture will start to get fuzzy if the resolution is set any higher than  $320 \times 240$ .

Connecting a digital video camera or even a console is just as easy thanks to the audio/video and S-Video connections in the unit. and this is where the real value of the PCTV lies.

You can burn information direct to CD,VCD or DVD and because of the video recorder capabilities there is the ability to add clips of anything from old

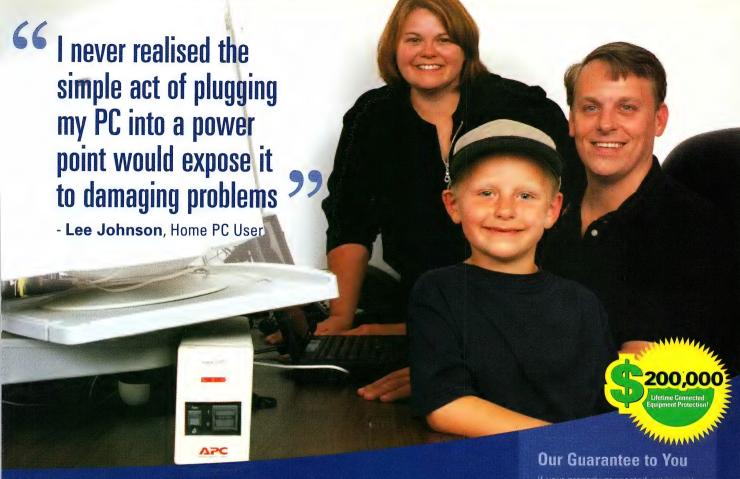


Watch TV on your PC, or connect a DV camera or console.

movies to the latest news into your own home movie productions.

However, a word of warning. If you intend to remove the program be cautious about what it takes with it. It mutes some sound cards by default so you may find you have no sound and if you do a clean uninstall you might find a few other problems around the place, as it appears to remove some vital files needed by Windows and some Norton software. However, overall it has plenty to offer for the amateur movie maker.

**David Hellaby** 



The spikes and surges coming in through the power socket were actually causing screen freezes, lock-ups, and other annoying problems. 🤧

- Lee Johnson, Home PC User

Do you experience similar PC problems? Keyboard lock-ups and frozen monitors are usually caused by bad power, which can threaten your PC up to four times a day. In addition, surges, sags and blackouts are nine times more likely to strike your PC than a virus<sup>2</sup> and are not just generated from lightning strikes. Something as simple as switching on a heavy appliance inside your home can jeopardise bances are the largest single cause of data loss, accounting for 45.3% of problems.

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# **CLEARLIGHT**

le've seen products like Silicon Memory's ClearLight range of portable hard drives before. yet the ClearLight has some of the most solid yet attractive plastic housing we've reviewed.

Encasing a 30GB 2.5in Hitachi notebook drive (running at 4.400rpm), the ClearLight reviewed came with dual FireWire ports, a funky blue activity LED and costs \$405. There's a full range available from

# PORTABLE HD

PRICE: \$405 SUPPLIER: Silicon Memory (02) 9417 7822 INTERNET:

www.siliconmemory.com.au

QUALITY ..... 02346 FEATURES ..... 0200 8 6 VALUE ..... 123 6 6 OVERALL ...... 0234 5 8



FireWire from \$357, and USB/FireWire combo drives from \$384. All use notebook disks running at 4,400rpm, so speed isn't the top feature.

Ruggedness on the other hand is a different matter. The casing may be clear plastic but it is solid to the touch and survived more than a bit of knocking about. It's also nice if you're the kind of person who loves to see the frenzied inactivity of chips, and the frenetic motionlessness of printed circuit boards.

On a bang-for-buck basis the ClearLight is a little pricey, yet if you value aesthetics and security over capacity then the ClearLight is the drive for you.

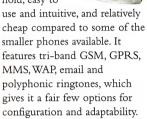
**Darren Ellis** 

# **SONY ERICSSON T310**

ony Ericsson's T310 is not the smallest or lightest mobile currently on the market, but its form-factor allows for a decent looking 256colour display. This is good enough for MMS, enhancing incoming calls with photos and pictures and for generally looking good when browsing SMSes, WAP and email, but it falls down when combined with the one hook sure to draw a young crowd to the T310 - the

inclusion of Tony Hawk Pro Skater 4. Here the very slow response time interferes so Tony's followed by his own contrail.

Otherwise. the T310 is comfortable to hold, easy to



At a modest \$449, it's not the cheapest phone available, and there are others with better screens with the same colour depths that are more suited to multimedia functionality.

**Darren Ellis** 

# MOBILE PHONE

PRICE: \$449 SUPPLIER: Sony Ericsson 1300 650 050

INTERNET:

www.sonvericsson.com/au/

QUALITY ...... 0234 5 8 FEATURES ..... 1234 5 6 VALUE ..... 0234 5 6 OVERALL ...... 1234 5 6

# **NOKIA 9210I COMMUNICATOR WITH TALX**

# ACCESSIBILITY

PRICE: \$1,799 9210i. \$695 for TALX SUPPLIER: Nokia. Quantum Technologies INTERNET:

www.nokia.com.au. www.guantech.com.au SPECIFICATIONS: Dual band

EGSM 900/188; 32-bit ARM9 processor; 16MB RAM; 16MB ROM; MMC slot; colour screen with 4,096 colours; WAP and email support; Symbian OS. Dimensions: 158 x 56 x 27 mm; 244g

VERDICT: It's not cheap, but the software does a remarkable job of enhancing this phone/PDA for the vision impaired.

QUALITY ..... 02345 FEATURES .... 02345 VALUE ...... 0234 5 6 OVERALL ..... 02006



Never judge a book by its cover, they say, and nowhere does this apply better than to the Nokia

9210i Communicator. It may look like an anodised brick, but it's robust and crammed with essential features, making it a powerful professional tool.

If looks are a weakness, then so is portability. Despite a range of holsters, the 9210i's size is offputting. However, keeping your data up to date while on the move is no problem thanks to the simple serial synchronisation cable and Nokia's PC Suite software. You can also buy a docking cradle that includes a battery recharger. Running out of juice isn't something you'll need to worry about too much, though, as the 9210i seems almost inexhaustible.

The miniature QWERTY keyboard is well laid out and responsive, with useful shortcut buttons to the various application sections placed on the top row. However, unlike the other PDAs tested, the 9210i's colour display isn't a touchscreen. Instead, a simple thumbpad is used to move the mouse cursor, which actually works well. The screen itself is also good and for the most part easy to read.

Thanks to the keyboard, the 9210i's included applications are very usable.

This encompasses a word processor and spreadsheet plus the superb SMS and email program, with the latter making use of the GSM modem, which supports HSCSD. There's no GPRS, though. But you can still send and receive attachments and browse the Web, with Java, HTML 4.01 and frames are all supported. You also get the usual PIM apps, such as contacts and calendar, although the 9210i was quite sluggish searching through them.

The body splits open to reveal a keyboard and elongated screen.

Although the 9210i

sells by itself for \$1,799, for an extra \$695 you can equip it with Quantum Technologies' TALX software. This is a text-to-speech agent for those with vision impairments and is quite a nifty program. TALX reads emails, WAP data, SMSes, and can even echo key presses, identify menu names and hotkeys.

Primarily for those with impaired vision, the TALX software is versatile enough to suit those with full sight but who are from non-English speaking backgrounds.

While it cannot escape a computerised diction, TALX is clear and simple to understand. **Tim Danton and Darren Ellis** 

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# **HP LASERJET 2300DTN**

# MONO LASER

PRICE: \$2,750
SUPPLIER: HP 13 23 47
INTERNET: www.hp.com.au
SPECIFICATIONS: 1,200 x
1,200dpi A4 mono laser;
26ppm; 266MHz processor;
48MB RAM; 10/100BaseTX;
parallel, USB 1.1; PostScript
3, PCL 6 and PCL 5E
emulation; 500-sheet, 250-sheet input trays, 100-sheet
input tray; drivers for
Windows 9x/ME/NT4/2000/XP

VERDICT: With immaculate text quality and best graphics performance yet this is an excellent choice for any small to medium workgroup.

 QUALITY
 19846

 FEATURES
 19846

 VALUE
 19846

 OVERALL
 19846



The 2300 series, HP's new laser offering for the small to mediumsized workgroup, includes a myriad

of significant improvements over the previous 2200 series.

Changes include a 266MHz processor instead of 133MHz, 48MB of RAM rather than 16MB, support for 802.11b and, most importantly, a speed boost from 18ppm to 26ppm. Indeed, such are the improvements that many buyers may be lured away from HP's larger workgroup printer, the 4300dtn (review on the *PC Authority* Web site).

The first potential problem for any workgroup printer is installation, but adding the 2300dtn to our TCP/IP network was a breeze. HP's software took care of everything, including the network settings.

The next challenge is speed, but the 2300dtn was barely

stretched by our tests. First up was our 50-page text document, which the 2300dtn produced at an impressive rate of 25.4ppm. Speed then increased to 26ppm during our Excel workbook and PDF tests; the only notable drop came when producing our complex 24-page DTP document, where the rate fell to 21.2ppm. While the 4300dtn is significantly faster at 45ppm, the 2300dtn fights back when it comes to quality.

It produced text of the highest order, with virtually no feathering or spidering, but it really stood out when producing graphics with some of the best images we've seen from a mono laser. Detail, saturation, sharpness and shading were all excellent, with greyscale fades proving exceptional (as mono lasers go). The only quibble was faint banding in pictures.

The 2300dtn also excelled in our Excel workbook test. Many



It produces quality results at a price that's right.

mono lasers struggle with the low-contrast differences caused by shaded cells, but it consistently produced highcontrast, easy-to-read results.

In terms of features it's heavily laden with duplex units, extra paper trays and HP's excellent Jetadmin network printer management utility. HP's embedded Web server technology is also shared and allows users to configure the printer via a Web browser.

**Nick Ross** 

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CORNEA 1810MF

QUALITY ..... 123456
FEATURES ..... 123456
VALUE ..... 123456
OVERALL ..... 123456



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# MINOLTA-QMS MAGICOLOR 2300W

# COLOUR LASER

PRICE: \$1,795 SUPPLIER: Minolta-QMS 1800 265 687 INTERNET:

INTERNET:
www.minolta-qms.com.au
SPECIFICATIONS: 600 x
600dpi A4 colour laser; GDI
printer; 16ppm mono, 4ppm
colour; 32MB RAM; parallel,
USB 1.1; 200-sheet
multipurpose input tray;
drivers for Windows 95/98/
ME/NT4/2000/XP

VERDICT: Excellent output, low running cost, a good turn of speed – all for a low price. The personal colour laser has finally arrived.



Surely, this can't be right – a fullcolour laser printer for only \$1,800? You'd better believe it,

The catch is that the 2300W is a GDI (graphical device interface) printer, so it doesn't have an internal processor and relies on the host system to do all the legwork in preparing the pages. Furthermore, it's parallel and USB 1.1 only and it can't accept a network card. That aside, the printer offers a fine set of features for the price. There's a 600 x 600dpi resolution with a 1,200 x 600dpi Fine ART mode, along with 4ppm colour and 16ppm mono print speeds.

Installation on a network involves little more than connecting the printer to a host system, installing the drivers and making it available to other network users. A local status monitor provides operational

detail about the printer, including printed pages, and a bar chart of toner levels.

In regards to performance the 2300W impressed, easily delivering its quoted speeds. A 24-page DTP-style document with plenty of graphics and colour photographs was completed at an average of 4.8ppm, while a 16-page plaintext letter was dealt with in a shade over one minute. Output quality for such a low-cost printer is good. Text was crisp and sharp with no signs of smudging, even down to the smallest font sizes. Graphics were also handled well, and you can expect charts and graphs in your reports to look good with no discernable cross hatching. Although not as vivid as other printers, the colour output has a clear vibrancy and the a test colour chart showed fades with almost imperceptible stepping, while grey shades using equal



At last, a colour laser for less than \$1,800.

mixtures of cyan, magenta and yellow were reproduced faithfully. Photo quality is also superb, with no banding and high levels of detail.

Overall, the Magicolor 2300W is a remarkable achievement. It delivers low-cost colour laser printing to the desktop at a highly affordable price and yet makes no sacrifices in print quality or speed.

**Dave Mitchell** 

# AMD Athlon™ XP Processor deals from Rectron

# **Wave Master System**

MD Athlon™XP Processor 2400+

Gigabyte GA-7N400-L1 Socket A Full ATX Motherboard -Force2 Ultra400 Chipset, 400FSB, Dual Channel DDR400, 8X

GP, Integrated AC97 & LAN

512MB PC3200 DDR RAM (Adata-Samsung Chip) 40GB IDE Hard Disk Drive (7200 RPM)

Leadtek I 28MB GeForce4 Ti4200 MyVIVO - 8X AGP

V/DV I/TwinView/VIVO

1.44MB Floppy Disk Drive 16X IDE DVD Rom Drive

A4Tech Optical Wireless PS/2 Mouse (KBS2348RP)

A4Tech Wireless PS/2 Keyboard (KBS2348RP) Cooler Master Wave Master (TAC-T01) Midi Tower

ase with 300W Seasonic/Seven Team Power Supply
Optional: Jazz Hi-Power J5901 (2.1) Subwoofer Speakers





# **Centurion System**

- AMD Athlon™ XP Processor 3000+

- Gigabyte GA-7NNXP Socket A Full ATX Motherboard nForce2 Ultra400 Chipset, 400FSB, Dual Channel DDR400, 8X AGP, Integrated AC97-6Channel / LAN / IEEE1394

- IGB PC3200 DDR Ram (Adata-Samsung Chip)

- I20GB Serial ATA Hard Disk Drive with 8MB Buffer

- Leadtek Winfast I 28MB FX5900MyVIVO

Graphic Card - 8X AGP with DVI/TV/Twin View/VIVO

- 1.44MB Floppy Disk Drive
- 16X IDE DVD Rom Drive
- 52x52x24 IDE CD Writer
- A4Tech Optical Wireless PS/2 Mouse (KBS2348RP)
- A4Tech Wireless PS/2 Keyboard (KBS2348RP)
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Optional: Jazz Hi-Power J9911 (5.1) Subwoofer Speakers





Vhile stocks last, from your local Rectron reseller :

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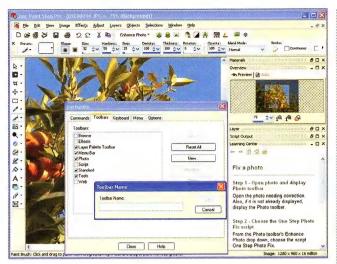
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# **JASC PAINTSHOP PRO 8.0**



The new interface provides streamlining, customisability and plenty of assistance.

hen you think of photo editing, the chances are you think of Adobe Photoshop. However, the majority of non-professional users don't need Photoshop's high-end power and can't justify its cost. That's where Paint Shop Pro (PSP) comes in. Its low price is definitely its initial attraction, but that has never stopped it aiming high. At times, as with version 6's introduction of vector layers, it has even left Photoshop trailing

# GRAPHICS

PRICE: \$269, \$149 upgrade SUPPLIER: CommUnique (02) 9622 5624 INTERNET:

www.comm-unique.com.au

REQUIREMENTS: 133MHz
Pentium; 128MB RAM; 200MB
hard disk space; Windows 98
(SP 2)/98SE (SP 1)/ME/NT 4
(SP 6a)/2000 or XP

VERDICT: With its new interface, layer handling, paint engine, tools, effects and scripting, Paint Shop Pro goes professional, but not enough to lure loyal Photoshop users.

behind. However, version 7's minor fiddling was a serious letdown and as time passed, it began to look as if PSP had run out of steam. Version 8, though, shows this isn't the case.

You begin to realise how fundamental the overhaul has been as soon as you load the application. PSP began life as a shareware package and its interface changed little over the years. Frankly, it looked old-fashioned, ugly and amateurish. Now everything has changed. The menu structure has been completely reworked, but it's the changes to the palettes that are most eyecatching. They are no longer freefloating but conveniently docked down the right of the screen. Meanwhile, the former Tool Options palette has been turned into an ever-present, contextsensitive Options ribbon bar running under the menus.

The alterations are so radical that it takes a bit of getting used to, even the keyboard shortcuts have changed. Fortunately, assistance is always at hand. PSP's online help is good and there's a comprehensive 'product tour' that shows you just what the software can do. There's also the new integrated 'Learning Centre' docker window, which provides HTML-based quick guide tutorials to walk you through

common tasks.

The interface certainly isn't perfect – it's still too technical and fussy – but you will soon come to appreciate the more streamlined way of getting things done. If you don't like the default setup, you can now customise your menus, toolbars and shortcuts then save and load your own preferred working environment.

#### Under the surface

The most obvious difference to the interface is the former Colour palette, now transformed into the Materials palette. This lets you seamlessly switch between handling solid, gradient and pattern-based paint and fills. The control over these has also improved: you can rotate gradients, rotate and scale textures, and load new textures from any supported file format (including formats containing transparency information). Plus, once you have your material just the way you want it, you can save it as a reloadable swatch.

The Layers palette looks comparatively untouched, but its use has changed just as dramatically. The big difference is the introduction of Layer Groups, which are sets of layers that are treated as a unit. This is handy for arranging your composition, but the PSP implementation goes much further and affects rendering. In particular, it's possible to change the opacity of all grouped layers simultaneously and any adjustment layers apply just to the current group rather than to

all underlying layers. Several new effects.

The same is true of masks. These are no longer treated as an attribute of a given layer, but as layers in their own right. Again, it takes a

little getting used to – the former Mask menu has been incorporated into the Layer menu – but the new system is more logical and powerful. And PSP 8 goes further still. In Selection Edit mode, the current selection also appears as a layer, which means you can use any tool to fine-tune it.

It's not only the main docker palettes that have been revamped. The toolbar now provides 17 main tool icons giving fly-out access to related alternatives. In some cases. there has been consolidation such as the incorporation of the Line and Node Edit tools into the Pen tool – while the main Retouch tool variations like Dodge and Burn have all been promoted to tools in their own right. Plus, you can now switch between opposite options such as Dodge/Burn, Darken/Lighten simply by using the opposite mouse button.

Again, the changes are more than just cosmetic - each of the major tools has been rethought and updated. The Zoom tool in particular is far more flexible, offering percentage zoom levels rather than fixed ratios, and the main zooming options have also been added to the Overview docker. The Crop tool now lets you crop to standard photo sizes while automatically updating the resolution value to match the desired size. And the control over text is now handled via the Options ribbon bar (though text is still edited in a window).

The biggest change however is to the brush handling for PSP 8's



various paint and retouch tools. The underlying engine for these has been completely overhauled, producing smoother results and offering two new options: Continuous Paint, where all inputs count as a single stroke (important for laving down textures); and Wet Look, which simulates the effect of water-based paint where edges are darker than the centre. The control over the brush shape has also been improved and you can save your customised brushes as presets alongside PSP's built-in range of creative options, such as crayon and charcoal. Plus, while you're painting, you gain far greater control over your brushes, especially if you're using a Tablet via the Brush Variance palette.

PSP 8 also offers a number of completely new tools. The Straighten tool lets you straighten scans or digital photos simply by marking a line that should be horizontal or vertical. The Perspective Correction tool is a useful variation on the same theme, letting you mark the four points of an object that should be rectangular. If you want to add distortions rather than remove them, PSP can oblige with its new Mesh Warp tool, while local effects such as twisting, bloating and pinching are handled with the new interactive Warp Brush great for producing Goo-style caricatures. Finally, the Background Eraser lets you paint away the background around objects.

When it comes to filters that affect the image as a whole, PSP 8 now follows the majority of its

rivals by splitting the commands into two camps: the main colour corrections available from the new Adjust menu, and special effects, which remain under the Effects menu. The handling of these effects has also been updated. The Effects Browser now generates pages of thumbnails at a time, not just for every effect but for each preset. You can also create presets from just about every filter dialog.

The support for third-party filters has been improved as well, not that most users will need them. PSP has always provided an extensive range of filters and this has been further expanded.

In terms of new functionality, the biggest single change in PSP 8 has to be the introduction of scripting. Using the new Script toolbar, you can now record any sequence of actions as a macro ready for playback (plenty of samples are also provided). The whole process is straightforward and you can even automatically record brush strokes - something Photoshop doesn't allow. If you need further control, it's possible to load your recorded script into PSP's built-in script editor, for example, to set up conditional processing. Plus, the ability to apply scripts via the Batch Conversion dialog allows you to automatically apply the same changes to multiple images.

The functionality is certainly impressive, but there's a catch. PSP's scripting is built on the open-source Python programming language, which majors on power rather than ease of use. That's no

problem if you're recording your macros, but editing is far more demanding (for example, you have to be careful when indenting as this determines scooping). There's also a serious security issue - a malicious Python script could format your hard

disk. PSP's solution is to limit those scripts that can run disk-based commands to a trusted directory, but it would still be wise to be cautious.

# Output advances

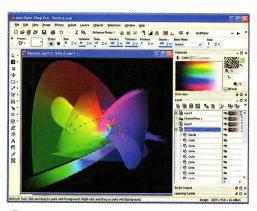
Once you have finished editing, it's time to

output your files. One of PSP's long-standing strengths is its ability to print multiple images on a single sheet – an essential feature for digital camera users. Printing has been updated with the ability to output images at a specific size or scale and positioned anywhere, while multiple image printing can be based on a range of grid-based templates with images scaled or cropped to fit their cells. PSP's Browser also uses output templates so that you can control the printing of image thumbnails.

When it comes to exporting and importing files, PSP 8 again sees major changes – though surprisingly there are little to its Web capabilities. There is new support for a range of file formats such as AutoCAD Drawing (DWG), Scalable Vector Graphics (SVG) as well as Wireless Bitmaps (WBMP). More regularly useful will be the support for PDF and the increasingly popular JPEG 2000 (JP2), which offers users lossless compression.

Best of all for digital camera users is the fact that EXIF data is supported for PSP, JPG and TIFF so that you can edit files without losing embedded information such as date, time, f-stop and ISO speed.

That's it for the major changes, but there are plenty of smaller advances scattered throughout the program. There's a new Black and White Points image adjustment that lets you colour correct an image by specifying highlight and shadow colours, while the Histogram filter now shows charts



The new interface provides streamlining, customisability and plenty of assistance.

for both original and adjusted images. Also, a new Info tab on the Overview window provides feedback on the current image and tool, as well as support for lossless JPEG rotation from the Browser. I particularly like the fact that when you close the application, you're presented with a list of all open images and can conveniently specify whether changes made to them should be saved or discarded.

The changes in PSP 8 are evident from first opening the application right through to closing - there's hardly an area that has been left untouched. There's no question that this is a major release, but I still have to admit to a sense of disappointment. I know that if Photoshop underwent a similar transformation I'd be raving, but in a way that's the problem. Too many of the core advances (such as the new layer handling, paint engine and scripting) will only benefit professional users and, let's face it, they aren't going to desert Photoshop for PSP. More to the point, those users looking for a cut-down Photoshop are now well catered for with the real thing: Photoshop Elements.

Rather than trying to out-Photoshop Photoshop, PSP would be better served by carving out its own territory in the same way as PhotoImpact and PhotoSuite. Having said that, there's no doubt PSP offers an incredible amount of advanced photo-editing power at an amazing price.

TOM ARAH

The new scripting is surprisingly powerful.



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- 64/128-Bit Wired Equivalent Privacy (WEP) Security Support
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#### XtremeG™ 11/54Mbps Wireless LAN PCMCIA Card

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- 10/100Mbps Fast Ethernet Interface for connecting to Wired Network
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- Support for IEEE 802.1x Security
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#### 22Mbps Wireless CardBus Adapter

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- · 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Built-in Diversity Antenna
- Drivers for Windows 98, 2000, Me, NT & XP



#### 11/54Mbps Dualband Wireless PCMCIA Adapter

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- 72Mbps Turbo Mode IEEE 802.11a
- Autosenses and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



# AirPlus Ethernet to Wireless LAN Client Adapter

- 22Mbps Wireless LAN Client Adapter which provides wireless communications for any Ethernet network device
- Suitable for any Ethernet Enabled device,
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- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard



# 22Mbps Wireless PCI Adapter

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Up to 20% better transfer with 802.11b
- 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Drivers for Windows 98, 2000, Me, NT & NT
- Upgradeable antenna



# 11/54Mbps Dualband Wireless PCI Adapter

- IEEE 802.11a (5GHz) and IEEE 802.11b (2.4GHz) Standard
- 72Mbps Turbo Mode IEEE 802.11a
- Autosenses and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



#### 22Mbps Wireless Concurrent Access Point & Bridge

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- Compatible with IEEE 802.11b standard
- DHCP Server/Client
- Web-based Configuration & Management
- Replaceable Antenna with reverse SMA connector for extending Wireless Range



#### 22Mbps Wireless Access Point

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard. Up to 20% better transfer
- · 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Built-in DHCP Server
- Configuration and Management via Web Browser
- External 2.5db Antenna with Reverse SMA Connector



#### 11/54Mbps Dualband Wireless Access Point

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- 10/100Mbps Fast Ethernet port for connecting to Wired Network
- Autosenses and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



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- Compatible with IEEE 802.11b (DSSS)
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- DHCP Server/Client
- Web-based Configuration & Management
- Replaceable Antenna with reverse SMA connector for extending Wireless Range

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- Compatible with IEEE 802.11b (DSSS) 2.4GHz
- 64/128/256 Bit Wired Equivalent Privacy (WEP)
- Security Support

   10Mbps WAN Port for DSL/Cable Modem
- Support NAT for single IP Address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- · Advanced Firewall Features
- Configuration & Management via Web Browser



#### Ethernet ADSL Modem

- · Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45)
- ADSL Interface (RJ11)
- · Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RCF 1483) Built-in PPPoE Client
- Configuration and Management via Web Browser
- Telstra Approved



# Ethernet ADSL Modem

- Connect single or multiple PC's on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45), ADSL Interface (RJ11)
- · Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RCF 1483)
- Built-in PPPoE Client
- Configuration and Management via Web Browser
- Telstra Approved

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- DMZ selectable Port
- · Advanced Firewall Features
- Configuration & Management via Web Browser



#### VPN Router for DSL/Cable Modems with 4-Port Switch

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- · LAN to LAN VPN-Stateful Packet Inspection -



## IP Router for DSL/Cable Modems with 4-Port Switch & Single Port Print Server

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- · Support NAT for single IP address & Firewall
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- · Built-in Telstra BigPond client



# IP Router for DSL/Cable Modems with 7-Port Switch & Single Port Print Server

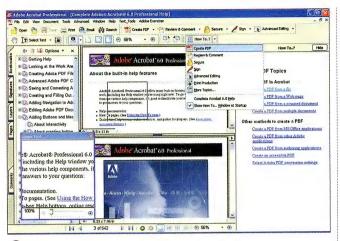
- 10Mbps Ethernet Port for DSL or Cable Modem
- 7-Port 10/100Mbps Switch
- · Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- · Support NAT for single IP address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Admin via Windows based program, Teinet or Web Browser
- Built-in Telstra BigPond client



LEADERS IN WIRELESS AND BROADBAND COMMUNICATIONS

# ADOBE ACROBAT 6.0 PROFESSIONAL





Acrobat 6 offers better help and viewing capabilities.



What makes PDF (Portable Document Format) unique is that it can provide an exact electronic

replica of any document from any application on all major platforms, including all text, graphics and fonts. It's an amazingly flexible format with a myriad of uses ranging from electronic manuals and e-books, through secure document exchange and archiving, to multimedia presentation and high-end commercial print.

Acrobat is the name Adobe has

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Pentium 133MHz; 128MB RAM; 245MB of hard disk space; Windows 98SE (standard only), NT 4 (SP 6), 2000 (SP 2) or XP

VERDICT: A major overhaul of the creation and review of PDF files, while new high-end design capabilities add to Acrobat's existing strengths

given to its technology built around the PDF, and in many ways Acrobat's flexibility is its problem as much as its strength. In particular, it can be difficult for users to get their head around just what Acrobat can do for them. That's why, with this latest release, Adobe has chosen to split the technology into a family of four increasingly powerful applications: Adobe Reader, Acrobat Elements, Acrobat Standard and Acrobat Professional. Unfortunately, Adobe had only released the Professional version at the time of going to press, so it's impossible to be precise about every individual feature that each version will offer, but the target audiences and dividing lines are clear.

The first rung on the ladder is the PDF viewer application previously known as Acrobat Reader and now renamed Adobe Reader. This is the version of Acrobat you'll almost certainly use even if you aren't interested in creating your own PDFs, as it's both free to use and distribute — authors can bundle it with their PDFs. So what's new apart from the ability to open files created with Adobe Acrobat 6's new PDF 1.5 format?

There's nothing too drastic to report in terms of the interface, but there are changes such as the new How To window on the right, providing access to task-based HTML help (assuming this finds its way into Adobe Reader –

all Adobe is currently saying is that it will have a similar styling to Acrobat 6 Professional). This side panel is also used for the new Microsoft-style Search feature, which lets you search through multiple PDFs without needing a pre-created index. The toolbars have also changed to include friendlier icons, most of which have text labels next to them, while more advanced features are accessed via drop-down menus.

For the Professional version (and possibly others), new navigation and viewing features include a Split view for viewing different parts of your document simultaneously and a Layers navigation pane for hiding and showing layered content. Zoom levels up to a stunning 6,400 percent are now supported and there's greater viewing control available via a Pan and Zoom window (this lets you set up the current zoom area interactively) and a Loupe tool that magnifies the area under the cursor (great for tiny captions).

Most eye-catching, or ear-catching, is the new Read Out Loud command available on supporting operating systems, although Microsoft Sam's flat voice and intonation soon grate.

#### Starting to write

Adobe Reader caters for the free consumption of PDFs; the rest of the Acrobat family is where you start paying. Acrobat Elements is the cheapest option, but it's only available to enterprise for volume licensing. The dividing line is that Acrobat Elements enables users to create their own PDFs. Traditionally, this has been taken care of by Acrobat Distiller, which converts PostScript print-to-disk files to PDF. This could be brought into play from any application via the Adobe PDF printer driver.

However, Adobe has recognised that Distiller and the whole idea of 'printing' to PDF was off-putting and little understood, so has done everything it can to push it into the background. The emphasis instead is on the one-click automatic creation of PDFs from

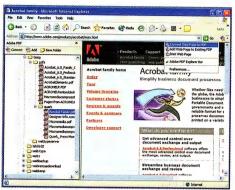
all the major Office applications. Macro-based 'Convert to PDF' icons are automatically added to Word, Excel, PowerPoint and now Outlook too. It's even possible to right click on a supported file in Windows Explorer and convert from there.

Moving up the ladder, Acrobat 6 Standard lets you combine files from different applications into a single document. The new Add Headers and Footers command adds consistent page numbering, while Add Watermark and Background lets you set up a shared look and feel. If you combine multiple JPEG images into a single PDF, you can use the new Picture Tasks commands to export, edit and print your photos based on imposition layouts.

As well as converting file formats to PDF, Acrobat Standard offers the ability to capture to PDF. The simplest version of capturing is the ability to convert a clipboard image. Paper Capture, which scans and converts existing documents, is in a different league. The scan is automatically OCRed so that the resulting text is searchable and the PDF size is kept to a minimum – ideal for archiving (especially if security is important, thanks to Acrobat's 128-bit encryption).

Even better is Acrobat's Web Capture. This lets you automatically convert Web pages and entire Websites to a single, easily archived PDF. Now the capability is built into Internet Explorer, which also supports inbrowser viewing (this is also promised for Netscape 7). So you browse as normal, and then switch to PDF to automatically store pages you want to keep. With its integrated Explorer Bar side panel, you can quickly target different PDFs to organise your permanent Web archives by subject.

But creating the PDF is only part of the story. With Acrobat 6 Standard, Adobe wants to make PDFs part of your everyday workflow, which means targeting workgroup collaboration. Acrobat has always offered commenting tools with which to annotate your



Acrobat now offers one-click PDF creation from the main Office applications including IE.



Acrobat 6 introduces a revamp of its reviewing capabilities.

PDFs, but their use has been pretty crude – the digital equivalent of plastering your document with sticky notes and then passing it on to the next user. Now the whole process has been overhauled.

The first sign of this is a revamp of the commenting tools. These have been rationalised with the less common options - such as Text Box, File Attachment and new Drawing options - moved to an Advanced Commenting toolbar. Meanwhile, the basic tools have been rethought. With the Text Edit tool it's now possible to automatically mark up insertions, deletions and replacements. The pop-up Note windows offer colour-coding, roll-over connector lines, background spell-checking, basic text formatting and even customisable semi-transparency.

Adding your comments is only part of an efficient workflow:

someone needs to initiate and control the whole process. This is simple to do with the new Send by Email for Review command with which you send the PDF and instructions to all interested parties. When users have added their annotations, they just hit the Send Comments command to send their response.

Rather than resending the edited PDF, this actually sends an FDF (Form Data Format) file to the originator; opening it automatically incorporates all comments into the single master file. Even more efficient for networked users or those with a WebDAV-enabled server is the Upload for Browser-based Review. This

automatically adds all comments to the single master PDF, which is browsable and editable by all (you can also now reply to existing notes to create comment threads).

And that's not the end of Acrobat Standard's review capabilities. To manage the collaboration process, it offers the Review Tracker side panel so the initiator can check who's responded and remind those who haven't. When all comments have been gathered, it allows you to print out side-by-side pages and comments with connector lines, though it's considerably easier to work your way through them with the reworked Comments navigation pane.

Here you can filter and sort all comments and set their status to accepted or rejected. If the original document was a Word XP file, it's possible to export all comments back into it as text mark-ups and comment bubbles to eliminate retyping, although, in this case, it might well be simpler to use Word's own review capabilities.

# Going professional

With Acrobat Standard, the PDF file acts as a useful business tool, a means to an end; with Acrobat Professional it takes centre-stage as the end product itself. As such, the emphasis is on PDF authoring. Acrobat Professional offers a number of features to add value to PDF documents, such as the ability to set up advanced forms (these can be filled in with the free Adobe Reader) and to manage XML-based tagging (this can improve the accessibility of PDFs through screen reflow on handheld devices, and through text synthesis for screen reading).

Another seriously underappreciated way of adding value to PDFs is through the Movie and Sound tools. In the past, these were limited to adding linked video (AVI or MOV) and audio (AIFF or WAV) files. Now – thanks to its support for QuickTime, RealOne, Windows Media Player and Shockwave Flash – you can also link or embed MPEG2, MP3, SWF, animated GIF and more. Just in case the end user doesn't have the necessary player installed, you can even set up alternatives.

A new area that Acrobat Professional targets is technical design. The one-click PDFMaker macro is automatically added to Windows versions of AutoCAD, Visio and Microsoft Project, and large ARCH, ISO, JIS and ANSI page formats are supported. The new drawing tools for annotating files will also help technical designers, as will the rulers, guides and grids. Also note the new Distance, Perimeter and Area tools for taking scaled measurements directly from the PDF Most important of all, Acrobat 6's new PDF 1.5 format now supports layers, which are essential for CAD-based technical drawings and will no doubt also come in handy for the next versions of InDesign, Illustrator and Photoshop.

Those involved in printoriented graphical design benefit even more. PDF has long been promoted as the natural singlefile, PostScript-based format for producing colour-separated commercial print.

In practice, it has left a lot to be desired, forcing professionals to turn to third-party plug-ins or Adobe's own Mac-only InProduction tools to ensure their press work goes smoothly. Now the most important prepress tools are built-in.

The new Preflight command lets you check your document against a range of profiles to help you spot potential problems such as mixed colour spaces or lowresolution images. You can also create files that are compliant with the PDF/X standards for pre-press document exchange. Acrobat's colour-management system now follows the same ICC profile-based model pioneered by Photoshop, allowing soft-proofing on-screen. You can finally output colour separations directly from Acrobat and, even better, it's possible to preview your individual CMYK plates on-screen as well as preview transparency flattening and overprinting.

Overall, there's a lot to take in and different users will benefit to different extents. Initially, there's comparatively little to persuade current users of Acrobat Reader to upgrade to Adobe Reader, but that should change when authors begin producing work that takes advantage of the new layer and multimedia capabilities. And of course it's free, so why not?

For potential Acrobat
Elements and Acrobat Standard
users, the easy creation and
integration of PDF into their
everyday workflows could prove
compelling. What's more, for
those who currently collaborate
via PDF, Acrobat Standard's new
review capabilities should boost
productivity. For designers and
high-end users, there's no
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TOM ARAH

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Memory Technology Leader

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# COREL PAINTER 8 🝊





hroughout its long and chequered career – first under MetaCreations, then Procreate and now Corel – Painter has always stood out as the artistic and creative computer application bar none. The reason is simple: Painter's unique range of natural media brushes.

Of course, other software developers have jumped on the bandwagon simply by making a brushstroke grainy and calling it 'charcoal' or darkening its edges and calling it a 'watercolour', but Painter is different. It looks closely at how the brush, paint and paper work together to produce their effect and then tries to replicate it.

The trouble is that the interaction of natural media is inherently complex. To produce a watercolour brush that diffuses and interacts realistically with the pigment already on the canvas involves controlling factors such as wetness, drying rate, evaporation threshold and wind direction. And these are only the parameters unique to the watercolour. Add in shared parameters, such as opacity, angle, resaturation and grain, and there's dozens of factors at work. In other words, Painter's natural media power comes at a price.

The problem with this was that previous versions of Painter never hid this underlying complexity — the user was bombarded with the different brush and material controls. Painter's desperate attempts to undo the damage and make the environment friendlier, by grafting on the odd pullout drawer and throwing in some large but unrecognisable icons, just made things even more confusing. 'Idiosyncratic' is one word for Painter's previous incarnations, but 'dog's dinner' is closer to the mark.

The end result was a strangely contradictory program: fantastically creative but at the same time intimidating in its technical depth – the one thing guaranteed to put off the intended artistic audience. Thankfully, Corel has recognised this fundamental problem and has completely overhauled the Painter interface. Overhaul doesn't do it justice; it's like opening a

completely new program. The first thing that hits you is the space opened up by removing the old MetaCreations clutter. Your second thought: but where is everything?

#### **TOOLS OF THE TRADE**

Let's start with the toolbar. In the past, this was a free-floating horizontal palette with scratchy icons in no particular order – it almost seemed like an afterthought. Now, the toolbar is central to your work in Painter and docked vertically on the left. It has also been rationalised and split into separate sections dealing with image editing, vector editing, formatting and display.

Below these are the current foreground and background colours, and lower down are small thumbnails for the current Paper, Pattern, Gradient, Nozzle, Weave and Brush Look libraries. Click on the thumbnail and you can choose from a drop-down list of presets, or call up the associated palette for greater control. It's amazingly streamlined compared with the old Art Materials palette, but it would be even better if options that weren't relevant to the current brush were greyed out.

Once you've selected your tool, you set its main parameters with the new Property Bar that runs under the menus. This is handy for swapping between major tool variations such as the various node-editing options and for controlling text without having to open the Text palette. For the different brush tool variations, it means you can quickly set size, opacity and other context-sensitive settings such as resaturation, grain and bleed (although this would be even easier if the settings were provided as sliders). There's also a useful Reset button to set any tool back to its defaults.

Running down the right is the area intended for Painter's palettes. There are now more of these than ever, as each of the previous palette sections, such as Colour Variability and Colour Info, have been promoted to palettes in their own right. They can be grouped and ungrouped, as well as hidden and

revealed, and it's possible to save and reload particular arrangements to set up the environment exactly as you want it. The end result is a much cleaner, more efficient and inviting interface.

By default, Corel sensibly brings together all those palettes that deal with colour, although the sheer range can still be

off-putting. Corel's latest addition is the Colour Mixer, which is designed to mimic an artist's palette. It offers a choice of primary colours, a Brush and Palette Knife to mix them and an Eyedropper to pick up the colour. Many Painter users already worked in a similar way using a separate image for colour mixing, but it's certainly handy to have a dedicated palette, especially with the ability to save settings and automatically generate colour swatches as needed.

# **SWEEPING CHANGES**

So far so good, but something important is missing: where are Painter's brushes? These remain fundamental to the software, but Corel has chosen to downplay their central role with the understated Brush Selector hidden away at the end of the Property Bar. Essentially, this takes the form of two simple drop-downs - first you select the category, then the actual brush variant. The dropdowns can take the form of visual thumbnails or even sample strokes. but it's easier to choose from the list of names

The choice of brushes is straightforward, but the range is astonishing. Corel has added 400 new brushes across 30 categories, of which nearly half are new. It sounds like a revolutionary increase in power, but there has also been some creative accountancy at work here. Many of Painter's former categories have simply been split – a good



Painter 8's new interface is unrecognisable compared with that in version 7.



Realistic natural media is the secret of Painter's success.

PRICE: \$649; \$329 upgrade

# GRAPHICS

for existing users of Adobe Photoshop 5.5, 6 and 7 full versions, Fractal Design Painter 4 and 5. MetaCreations Painter 5, 5.5, 6 and Classic, procreate Painter Classic, Corel Painter 6, 7 and Classic. **SUPPLIER:** Corel 1800 658 850 INTERNET: www.corel.com SPECIFICATIONS: 450MHz Pentium III: 128MB RAM: 200MB HD space; and Windows 98 SE/ME/NT 4 (SP 6)/2000 (SP 3) or XP.

VERDICT: Fundamental changes to Painter's interface and brush handling help tap the program's existing natural media.

EASE OF USE .. 00005 6
FEATURES ... 00005 6
VALUE .... 00005 6
OVERALL ... 00005 6

example being the Dry Media brushes, which have been divided into Chalk, Charcoal, Crayons and Pastels. And, within each category, new brushes are usually basic variations of shapes and sizes.

In fact, only one brush category is completely new - Digital Watercolour. This in itself is strange, as watercolours have always been one of Painter's strongest areas, and no-one could say the new brushes are as realistic as the old ones. This is hardly surprising as there are only two dedicated parameters at work here - diffusion and wet fringe. But, in a way, that's the point.

Painter's existing complex watercolours can only be used on their own dedicated 'wet' layers and it takes time and processing power to apply them. The new Digital Watercolours are much simpler and faster, and can be mixed with other brushes to produce attractive results.

By providing a much wider range of brush presets, along with the Property bar for setting the most important brush parameters, there's no shortage of immediate creative power, but there are still occasions where you want greater control. This is where Painter's new Brush Creator dialog comes in. In its main Stroke Designer tab, you can select one of the 16 control sets, such as General, Well, Liquid Ink and Impasto, and the associated parameters appear next to it (a lot simpler than the former Brush Controls palette's scrollable system). What really makes the

The Sketch filter turns images into artistic drawings, but don't expect miracles.



difference is the large preview canvas to the right of the dialog, where you can try out changes before using them in earnest. What's more, the dialog stays open so you can seamlessly swap between your current image and the Brush Creator whenever you want to fine-tune your brush.

Of course, it's a lot to ask users to understand what they can do with each of the 16 control sets, let alone each of the parameters spread between them. The Brush Creator dialog's additional tabs aim to make this easier. Using the Randomizer tab, Painter generates random variations on the current brush, which are displayed visually as preview strokes. The Transposer tab offers more input and control, as you select two brushes and Painter automatically creates intermediate variations. The results can be unexpected, but that's often an advantage and, once a variation takes your fancy, you can always fine-tune it back in the Stroke Designer. Be warned: use of the Brush Creator can be addictive.

In fact, this can be a serious problem - it may be virtually impossible to recreate an unsaved customised brush, but that's often what you have to do if you decide to rework an area of your image. However, Painter's new Brush Tracker palette records each of the last 25 brushes you've used. It's handy for quickly swapping between recently used alternatives, but the system would be much more useful if it only tracked those brushes actually used on the

current image. rather than every variation you try out in the Brush Creator. It would be better still if these brush settings were stored in the image file itself.

# **PHOTOSHOP** INSPIRATION

Painter 8's main focus is clearly on its interface and brush handling, but there are a number of

other important improvements.

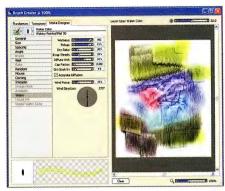
The first of these are apparent in Painter's layer handling, which now supports layer groups. These are useful when keeping on top of complex compositions, and the laver masks also enable nondestructive masking. Selection handling has been updated too, with the ability to save up to 32 selections as alpha channels in the new Channels palette. Disappointingly though, this won't let vou work on separate colour channels.

Both of these changes are especially significant as they're clearly inspired by Photoshop and, along with the discount upgrade price for Photoshop users, indicate Corel's determination to make Painter the

natural artistic partner to the market-leading photo editor.

Most important in this regard is the ability to open and export to PSD format, although this doesn't extend to full support for Photoshop's adjustment layers or Painter's dynamic plug-ins. Noone could say Painter was a mainstream application - that's its strength - but at least it no longer seems wilfully perverse.

Finally, Painter 8 also introduces the Sketch filter, designed to automatically turn existing images into hand-drawn sketches. Using the filter's small preview, you set the sensitivity, smoothing and thresholds, and Painter pulls out the outlines accordingly. It's a useful tool, but don't expect it to work miracles - ultimately, as Painter knows only too well, nothing can replace the eye and hand of the artist.



Take absolute control of your brushes with the highly addictive Brush Creator.



Photoshop compatibility is boosted in Painter 8, with support for layer groups, masks and alpha channels.

> For those users willing to put in the effort. Painter has always provided rich rewards, and this release not only boosts Painter's power making it much more accessible. Although there's just one problem - reliability.

> Painter's natural media approach is inherently complex and demanding, and the program has always had a tendency to crash. Sadly, this release is no different, except that this time the program doesn't just crash; it disappears and takes any unsaved work with it.

As it stands, this initial release of Painter 8 isn't ready for production environments. However, assuming Corel improves reliability in a service update, Painter 8.1 should be the release that finally opens up Painter's amazing creative power to everyone, especially at its new attractive price.

Tom Arah





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# RED HAT LINUX 9



espite various attempts at Windows Desktop alternatives, Linux is still best suited to servers, for which Red Hat is by far the most popular choice. With this in mind, it came as no surprise when in May 2002 Red Hat split its product line in two: Linux and Enterprise Linux.

The former flagship, Red Hat Linux, is now 'a community product for SoHo users, independent professionals, students and hobbyists with minimal support needs'. Prices start at \$36.95, but you can still download a version as CD ISO images.

Red Hat Enterprise Linux has a slower release cycle of 12-18 months, contains optimisations for SMP, I/O and database operations, and includes bundled support and consultancy. This comes in three variants: WS (Workstation or Client Edition), ES (Enterprise Server) and AS (formerly Red Hat Advanced Server). WS supports up to two CPUs and 4GB of RAM, ES adds various server applications, and AS adds support for up to eight CPUs and 16GB of RAM, plus clustering failover and load balancing. Currently at version 2.1, it's priced from \$575.90 for WS and up to \$4,795.25 for the Premium AS Edition.

Red Hat Linux 9, meanwhile, is the latest effort at a Desktopfriendly OS, comparable to Mandrake or SuSE. As it's no longer the basis for the Enterprise offerings, Red Hat is free to update it more frequently, leading to an unprecedented jump from version 8 to 9. However, the differences are fairly modest. There are new device drivers for a variety of 3D cards, support for Bluetooth, PDAs and digital cameras, a Windows Terminal Server client, CUPS (the Common Unix Printing System, as used in Mac OS X) and a new

The default installation gives you an elegantly minimal GNOME 2.2 Desktop, with toolbar icons for Mozilla 1.2.1, Evolution email (an Outlook lookalike) and OpenOffice 1.0.2's

Writer, Impress and Calc. The Desktop is clean, with only a link to the user's home directory, a wastebasket and a Start Here folder. This contains folders called Applications, Preferences and System Settings, offering easy access to the software on the Launch menu and both personal and system-wide settings. The graphic design is immaculate, icons and menus have sensible names such as Instant Messenger rather than application names, and there's no clutter.

This is the second version of Red Hat's Bluecurve interface, and in terms of visual appeal it's superb – more elegant and refined than Windows XP's Luna and more subtle than Apple's Aqua. Window dragging and resizing is smooth and solid, there's an hourglass – a Linux novelty – and text is attractively antialiased throughout the GUI, even in applications such as OpenOffice and Mozilla.

With just a few clicks in Add/Remove Applications under System Settings, I added the system and development tools, allowing kernel recompilation and connection to Windows servers, and the optional KDE system. None of this required a reboot, and afterwards I could connect to an XP machine on the network from the command line without further configuration. Even the KDE 3.1 Desktop is identical to the one found in GNOME, complete with antialiasing.

However, unlike distributions such as Xandros or Lycoris, or indeed the general-purpose commercial systems, Red Hat 9 isn't designed to directly replace Windows or co-exist with it, and there's no concession to novices moving over from Windows. There's no network browser or Explorer equivalent, no mount points or icons for Windows or other Linux file systems, and no attempt to resemble any other operating system.

Like version 8, it doesn't support proprietary formats such as MP3, Shockwave, Flash or RealMedia, even though free players are available.



The elegantly simple GNOME Desktop has helpful icons for setting personal preferences, adjusting system settings and starting applications.

Under the hood, it's modern but not state-of-the-art. The kernel, XFree86 and GCC are, at the time of writing, the latest versions (2.4.20, 4.3.0 and 3.2.2, respectively), but there are no devfs, for example. The journaling ext3 file system is used by default, although it happily mounted ReiserFS, FAT16 and FAT32 partitions, but not NTFS.

Hardware detection is good, although not perfect. The wheel on a USB mouse worked in all programs, but although it detected an AGP NVIDIA TNT2 card and configured it correctly, it used the open-source 2D-only driver – NVIDIA's proprietary 3D accelerated drivers currently don't work. Plus, it failed to notice a PC card FireWire adaptor or laptop power management.

Version 9 is user-friendly and as accessible as any Desktop Linux, and looks considerably better than its rivals. However, it isn't an easy transition for the Windows user.

Yet, Red Hat remains the closest thing the Linux world has to an industry standard, and this version is the best ever. But if you want a straightforward replacement for Windows, or simply maximum simplicity or versatility, you are better off looking at distributions of Xandros or Lycoris.

**Liam Proven** 



Apps such as Evolution are designed to be familiar to Outlook users.

# OPERATING SYSTEM

PRICE: Personal \$36.95; Professional \$269.95 SUPPLIER: EverythingLinux (02) 8752 6666

INTERNET:

www.everythinglinux.com.au
REQUIREMENTS: 400MHz

Pentium II; 192MB RAM; and 475MB hard disk space

VERDICT: With a Desktop that's a lesson to all distributions, this is the best ever 'standard' Linux, but it is still missing some important features.

# **POWERQUEST DRIVE IMAGE 7.0**

eleased already in the U.S. and due out here shortly. PowerQuest has announced Version 7 of its Drive Image software. Some significant changes have been made with the latest version including plenty of sensible

### IMAGING/ RECOVERY

PRICE: \$134 (approx) SUPPLIER: PowerQuest (03) 9929 9733 INTERNET: www.powerquest.com **REQUIREMENTS: Windows** XP/2000 Professional (SP2); 256MB RAM; 45MB disk space (For install): CD-ROM; and additional 40MB disk space for .NET framework

VERDICT: There are plenty of features to be found here, a great piece of software for drive imaging and backup.

features for offsite data storage and time and space saving.

Reviewed back in August 2002 (review on the PC Authority Web site) we were fairly impressed then by it's intuitiveness during backups. The new version however impresses us further still with its ability to backup - but entirely through the operating system, allowing you to store data without leaving the Windows environment.

Now supporting the ext3 and Reiser file systems, Drive Image 7 is multi-platform oriented, while the Windows user interface mirrors XP's style making backing up easier for the novice user.

More great features include: SmartSector technology, which images only written-to sectors of the drive, saving time while retaining settings and files; exporting disk images to mapped network drives as well as local storage; while block-based imaging captures all files including hidden and encrypted directories.

On the restore front, version 7 ensures you can reload disk images by mounting them as virtual drives, assigning drive letters, viewing contents and copying individual files and folders from the backup to another location rather than restore an entire image for a

few files. Another handy idea is that you're able to save images externally with FireWire, USB devices and DVD, perfect for offsite storage and making a lot of sense given the risk of loss in the event of local drive corruption.

With plenty of new features to be found, Drive Image 7 now offers even more comprehensive insurance against data loss, while maintaining personal settings and ease of use for even the most



The easy to use wizards make it perfect for even the most inexperienced user.

inexperienced users.

Drive Image 7 is supportive only of Windows XP/2000, however it is supplied with Drive Image 2002 which scales all the way back to Window 95, catering to users with older operating systems. Drive Image 7 is a great piece of software that deserves to change the way we think about data retention and backup. Look out for it soon.

Dan Chiappini

# **WINZIP 9.0 BETA**



The user interface overlays the evolved security features of WinZip.

### COMPRESSION

PRICE: \$US29 (approx \$44) **SUPPLIER:** WinZip INTERNET: www.winzip.com **REQUIREMENTS: Windows** 98/ME/NT 4.0/2000/XP

VERDICT: Both the core and frills have seen some useful improvements - in short, WinZip has become better and more user-friendly.

inZip has become the most popular archival program used on the Windows platform, and it's good to see some serious innovation in this revision. Highlights are stronger encryption, greater file capacity and better compression.

WinZip takes its encryption standards to a newer level. Previous versions of WinZip used the 'Zip 2.0' encryption method, but WinZip 9.0 employs a method known as AES (advanced encryption standard). This is offered in two strengths - 128-bit (strong) and 256-bit (stronger). While traditionally WinZip only allowed you to encrypt files that were being added to the archive, this version allows encryption of files already existant within the zip file. WinZip 9.0 also offers Zip 2.0 encryption for the sake of portability and compatibility, as AES-encrypted zip files can only be accessed by AES

compatible packages.

While drive capacity increases, so have the numbers and sizes of files - WinZip 9.0 imposes no practical restrictions on zip file size. It offers a 64-bit extended format that breaks through the previous barrier of 65,535-files or 4GB. This format is only used when the said limit is passed, otherwise the original is still used. WinZip's new muscles extend down to its core functionality - an 'enhanced deflate' option offers a degree of compression greater than the usual 'maximum'.

Though this is a handy space saver on systems with WinZip 9.0, versions prior to 8.1 and some other archival software will not be able to handle files compressed with this option.

A little behind the times, but finally WinZip offers a much sought after feature - a 'split zip file' option that lets you divide archives into individual files with user-defined sizes - regardless of whether you are using floppies. This is useful when transferring files over slow or unstable network connections (wireless) and for sending attachments. A number of other improvements have also been implemented tooltips indicating archival contents, navigational enhancements and a nifty little tray icon. More significantly, WinZip has made add-on packages available over the Web, the most attractive being 'Command-Line Support' that will let you use WinZip in a manner similar to archival programs from the good old DOS days.

It's easy as ever to use and it's safe to say that it has only gotten better. All registered users of the earlier English-language versions of WinZip will be able download a free upgrade to WinZip 9.0 upon release.

Nirmal Chandrasena

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Type II PC-card slot

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Built-in Wireless 802.11b LAN module option,

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Technology with a human face

# HIDING IN PLAIN SIGHT

ubtitled, 'Steganography And The Art of Covert Communication', Hiding in plain sight is a thoroughly intriguing book about hidden communications. Whereas encryption is an obvious, yet impervious, form of communication, steganography (stego) is more about the communication aspect as it hides data where people may not think to look. Those who use stego today are able to hide documents

### COMMUNICATIONS

PRICE: \$69.95 SUPPLIER: John Wiley & Sons 1800 777 474 INTERNET: www.johnwiley.com.au

ISBN: 0471444499

CONTENT ..... 02346 DESIGN ...... 0200 5 6 VALUE ..... 0234 OVERALL ...... 0234 8 0 and images within sound files. movies and graphics on Web pages. Post-September 11 there were fears that the



terrorists had been using stego on images on eBay to communicate, and the author, Eric Cole, suggests having a trawl through eBay yourself. The book describes the many different ways stego is used, ways of detecting stego, ways of using stego yourself, and comes with a CD full of applications and reference images from the book. The latter is welcome as many of the printed images are of low quality. Although light on the technicalities in the early chapters, the book does eventually delve deeper, and it's an interesting read. Darren Ellis

# **RUNNING MS-DOS**

our first thought might be, what has MS-DOS got to do with anything these days, but when you consider the huge existing install-base of Windows 95 and 98 machines, plus the number of problems you can still have with Windows that can be solved with a bit of command line typing, you'd be surprised at what a handy reference this book can be.

In its 20th year, Running

MS-DOS

PRICE: \$69.95 SUPPLIER: Woodslane (02)

9970 5111 INTERNET:

www.woodslane.com.au

ISBN: 0735618127

CONTENT ..... 02345 DESIGN ...... 02346

VALUE ..... 0234 5 OVERALL ...... 02346 MS-DOS is a one-stop guide to the operating system. Covering the basics from how the OS works to tweaking it for better performance (HIMEM and EMM386 anyone?), it also delves

into optimising your hardware, creating batch files and running legacy applications.

It's a thorough book, with a simple to follow design, and although it deals primarily with MS-DOS version 6.22 (95/98 use 7.0), it also works as a great point of reference for today's command-line operating system adjuncts.

Darren Ellis

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### DVD

PRICE: \$39.95

SUPPLIER: Village Roadshow Entertainment INTERNET: www.village.com.au SPECIFICATIONS: Region 4; 16:9 aspect ratio; Dolby 5.1 surround sound; and a running time of 88 minutes

**VERDICT:** A top *Matrix* experience for the franchise fans, with some excellent and entertaining animation.

CONTENT ..... 02845 FEATURES .... 02846 VALUE ..... 0234 OVERALL ..... 02946

003 is going to be remembered as the year of the Matrix glut, with two movies, A multi-platform computer game and DVD releases across the year. Rumours are that there is even another game coming out, although this one may not hit until 2004. For now, in between Matrix Reloaded and Matrix Revolutions theatrical releases is the release of the companion DVD, Animatrix.

Featuring nine short movies drawn by various Japanese animation houses, the Animatrix DVD expands on the limited universe depicted in the two movies so far, and gives a look into different aspects of the Matrix concept, such as the history of Earth.

This includes the excellent two-part The Second Renaissance that portrays the rise of the robots, the downfall of man and creation of the early Matrix.

The brilliant The Final Flight of the Osiris sets the scene up for the computer game Enter the Matrix and movie Matrix Reloaded. Other films show what can happen when there's a bug in the Matrix rendering, how users can burst free from the matrix and various forms of resistance to the dominating machines.

Watching the films it's hard to tell whether the Animatrix comprises more homage to the Matrix universe or to Japanime. Each animation has a distinct style to it, from animation techniques to storylines and is directed by the top animators including Square (Final Fantasy: The Spirits Within), Peter Cheung (Aeon Flux) and Shinichiro Watanabe (Cowboy Bebop). Four of the films have scripts written by the



**⊕**Nine *Matrix* animations from the leaders in the field, including Peter Cheung.

Wachowski brothers, but each short film has its own distinct flavour and feel.

The video transfer to DVD is seamless with the films being created digitally, and the 5.1 Dolby Digital audio is superb.

With a few extras on animation in general, plus featurettes on the creation of each short movie, the Animatrix is not exploding with bonus features but there's enough to digest. One downside is that I hardly think throwing in a few Web links really constitutes proper DVD-ROM 'content'.

**Darren Ellis** 







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# SOMETHING ABOUT SCANNERS

Need to get your photos digitised? Forget about a photo house to convert your shots, scanners are so cheap and easy to use you can do it yourself - and save some cash.

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### **SCANNERS**

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ven with the recent proliferation of digital cameras, it still remains that the vast majority of cameras in the average household are film-based. Even if you've already gone digital, you'll still have a collection of memories on silver halide that need preserving. A flatbed scanner is the best device for turning those collections into organised digital libraries to easily share with your family and friends, and you'll also be able to edit, enlarge or reprint them.

A scanner also makes the ideal partner to a printer for quick copying or faxing of documents. OCR software, as bundled with all the scanners we tested, means you can turn a printed page into editable text for emailing or editing without the need to spend time retyping it out.

This Labs brings together 16 of the best scanners currently available on the market. Since our last Labs test. it's clear that optical resolutions are on the up and up. Resolutions for some scanners here go up to 2,400 x 4.800dpi (dots per inch, sometimes referred to as 'ppi' or pixels per inch). Previously, this was a resolution more commonly associated with dedicated film scanners, but with integrated transparency units you can now obtain superb results without needing two separate peripherals.

Another shift concerns interfaces. Higher optical resolutions demand greater bandwidths to transfer the data more quickly to the PC. This month, we see scanners equipped with USB 2.0, IEEE 1394 and SCSI interfaces significantly outperforming USB 1.1 and parallel devices.

If you're on a tight budget, some of the cheaper scanners could look tempting, but image quality varies considerably between them. It's not just about resolution - the quality of the optics and electronics play a huge role. So take a look at our detailed performance analysis, read through the reviews, and you're sure to find a scanner that meets your needs.

**TECHNICAL EDITOR: Darren Ellis** CONTRIBUTORS: Dan Chiappini, Nirmal Chandrasena, Tim Danton, Tim Dean, Jim Martin, Stewart Mitchell

Manufacturer and model	BenQ S2W 5000U	Carron CanoScan 300	oF Canon CanoScan	Canon LiDE 20	l Enroy Outlet	I Programme		
Price (inc GST)	\$119		9900F		Epson Perfection Photo	Photo RECOM	on 3200 HP Scan Jet MENDED	2300c HP ScanJet 3570c
Supplier	BenQ	\$299 Canon Australia	\$799	\$149	\$549	\$899	\$149	\$299
	(02) 9714 6800	1800 021 167	Canon Australia 1800 021 167	Canon Australia 1800 021 167	Epson 1300 304	767 Epson 1300 30	4 767 HP 13 23 4	7 HP 13 23 47
Internet	www.benq.com.au	www.canon.com.au	www.canon.com.	au www.canon.cor	n.au www.epson.com	n.au www.epson.co	om.au www.hp.co	m.au www.hp.com.au
Warranty  Physical characteristics	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year
Dimensions	41.2 x 7.3 x 25.8	/4 w # 4 w 0 # #	-1121			\$19000000000000000000000000000000000000	West of the dust of	
(W x H x D) cm	41.2 x 7.3 x 25.0	46 x 7.1 x 25.7	50.9 x 12.7 x 29	38.3 x 3.4 x 25.6	45 x 11.6 x 27.6	47.6 x 12.2 x 30	50 x 6 x 27	50 x 8.6 x 30
Weight (kg)	2.1	2.5	5.2	1.5	3.1	6	2.17	3.17
Maximum scanning area (cm)	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7	21.6 x 29.7
Light source	Cold cathode fluorescent lamp	Cold cathode fluorescent lamp	Cold cathode fluorescent lamp	LED	Cold cathode fluorescent lam	Cold cathode p fluorescent lan	Cold cathod	
Sensor	CCD	CCD	CCD	CIS	CCD	CCD	CCD	lamp fluorescent lamp
Scanning method	Single pass	Single pass	Single pass	Single pass	Single pass	Single pass	Single pass	
Connectivity type	USB 1.1	USB 2.0	USB 2.0; FireWire	USB 1.1; 2.0	USB 1.1; 2.0	USB 2.0; FireW		
Resolution & colour depth						1 No 1999 Nacional Regard Apollogical Security		
Optical resolution (h x v ppi)	1,200 x 2,400	1,200 x 2,400	3,200 x 6,400	600 x 1,200	2,400 x 4,800	3,200 x 6,400	600 x 600	1,200 x 1,200
Maximum interpolated resolution (h x v ppi)	19,200 x 19,200	9,600 x 9,600	9,600 x 9,600	9,600 x 9,600	12,800	12,800	99,999	99,999
Maximum colour depth (bits)	48	48	48	48	48	48	48	48
Software								
OS supported	Windows 98	Windows 98	Windows 98; MacOS 9.x	Windows 98; MacOS 9.x	Windows 98; MacOS 8.6	Windows 98; MacOS 8.6	Windows 98	Windows 98; MacOS 9.1
Image editing	Ulead PhotoExpress	ArcSoft PhotoStudio	ArcSoft PhotoStudi Adobe Photoshop Elements	o, ArcSoft PhotoStu	dio Adobe PhotoShop Elements	Adobe PhotoSho Elements	HP photo and imaging soft	
OCR	ABBYY FineReader Sprint	Omnipage SE	Omnipage SE	Omnipage SE	Generic OCR	Generic OCR	IRIS OCR	IRIS OCR
Manufacturer and model name	HP ScanJet 4500c	Microtek ScanMaker 4900	Microtek ScanMaker 6800	Mitsubishi DV1250U	Mitsubishi DV650U LABS WINNER	Mustek BearPaw 1200CU Plus	Umax Astra 6700	Umax VistaScan
Price (inc GST)	\$449	\$399	\$999	\$269	\$149	\$99	\$499	Astra 4600 \$199
Supplier	HP 13 23 47	Microtek 1800 008 899		Mitsubishi	Mitsubishi	Natcomp	AIM Digital Imagin	
Internet	www.hp.com.au	www.microtek.	www.microtek.	(02) 9684-7777 www.mitsubishi-	(02) 9684 7777 www.mitsubishi-	(02) 9712 0099 www.natcomp	1800 008 899 www.ausmedia	1800 008 899 www.ausmedia
Warranty	4 voor			electric.com.au	electric.com.au	.com.au	.com.au	.com.au
Physical characteristics	1 year	1 year	1 year	1 year	1 year मानुसूति गर्वतः	1 year	1 year	1 year
Dimensions (W x H x D) cm	54.5 x 9.2 x 31.2	49 x 6.1 x 30	50 x x 11.4 x 29	// au a a sian /		Market Comments of the Comment		
Weight (kg)	3.6	2.6		44.9 x 9.3 x 28.6 2.8	41.2 x 7.3 x 25.8 Teles.	40.5 x 3.7 x 28.1	57.8 x 8.9 x 27.2	45 x 6.4 x 26
Maximum scanning area (cm)	21.6 x 29.7	21.6 x 29.7		21.6 x 29.7	21.6 x 29.7	1.9 21.6 x 29.7	2.8 21.6 x 29.7	2 21.6 x 29.7
Light source	Cold cathode fluorescent lamp	Cold cathode fluorescent lamp		Cold cathode Cold cathode	Cold cathode fluorescent lamp	LED	Cold cathode	Cold cathode
Sensor	CCD	CCD	The second second second second	CCD	CCD GAGACIAN ANNA	CIS	fluorescent lamp	fluorescent lamp
Scanning method	Single pass	Single pass	Single pass (two 5 for Digital ICE)	Single pass	Single pass	Single pass	Single pass	Single pass
Connectivity type	USB 1.1; 2.0	USB 1.1	USB 1.1; 2.0	JSB 1.1	USB 1.1 - 32 (12)	USB 1.1	USB 1.1; 2.0	USB 1.1
Resolution & colour depth							Carrier Control	
Optical resolution h x v ppil	2,400 x 2,400	4,800 xs 2,400	4,800 xs 2,400 1	,200 x 2,400	600 x 1,200	600 x 1,200	2,400 x 4,800	1,200 x 2,400
			4F FOR 1175 FOR 1485 1	9,200 x 19,200	19,200 x 19,200	19,200 x 19,200	9,600 x 9,600	19,200 x 19,200
Maximum interpolated esolution (h x v ppi)	99,999	65,535 x 65,535	65,535 x 65,535 1					
Maximum interpolated	99,999		48 4	8	<b>36</b> 1. 1855 1915	48	48	48
Maximum interpolated resolution (h x v ppi)				8	<b>36</b> - 1	48	48	48
Maximum interpolated resolution (h x v ppi)  Maximum colour depth bits)		48 Windows 98;	48 4	8 /indows 98	Windows 98	48 Windows 98; MacOS 8.6	Windows 98;	48 Windows 98
Maximum interpolated esolution (h x v ppi) Maximum colour depth bits).	48 Windows 98;	Windows 98; MacOS 9.x Photoshop LE and	48 4 Windows 98; W Mac05 9.x	/indows 98 lead Photo Express	Windows 98  Ulead Photo Express	Windows 98;		

# PERFORMANCE ANALYSIS

The labs team this month tackled scanners. Test designed, they put 16 scanners through their paces to bring you the good, and the not so good.

esting scanners is a tricky business. Unlike PCs or graphics cards, which can be benchmarked to show performance, scanners are inherently more subjective. As such, we've developed our own in-house tests for scanners that remove as much subjectivity from the process as possible. Our tests were designed to highlight all the individual aspects of the scanners that relate to image quality and speed, and give a reliable indication of real world performance.

We also had all the test images scanned by our bureau on their professional drum scanner for reference.

### The tests

Each scanner was freshly installed with the latest drivers on the *PC Authority* testbench, consisting of a 3GHz Pentium 4 with 512MB of DDR RAM, and connected through the fastest connection option, whether that be USB 2.0, USB 1.1, FireWire or Parallel.

First we tested colour accuracy - important if you want your scanner to accurately reproduce colour photos or

graphics. We scanned a colour target from AGFA, which featured multiple levels of red, green, blue and black using the scanner's best colour settings. We then imported the image into Adobe Photoshop and

Photoshop's eye dropper tells you how close to the actual colour the scanner managed to achieve.

used the eye dropper tool to take a colour sample to see how close to the true colour it was.

Each scanner's results for red, green and blue were then compared to the drum reference scan, the deviation from the correct colour was determined as a percentage then averaged to give a single result.

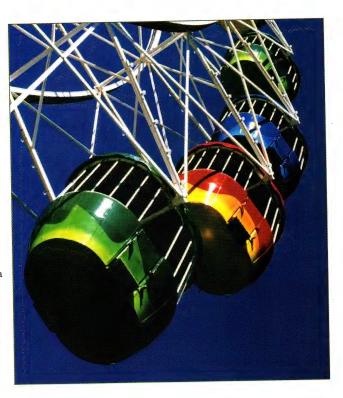
Next we scanned a large photographic print, which contained many colours and fine detail. This scan was performed at the scanner's maximum optical resolution and at top detail settings. The maximum optical resolution is the

actual resolution of the optics of the scanner, and is usually around 1,200 or 2,400dpi these days.

Many scanners also feature interpolated resolution settings, which can be as high as 65,000dpi or more, although these settings are practically useless and only used when performing a huge enlargement. In the real world, 300dpi, or 600dpi at the most, is more than adequate for most applications.

We also scanned the same photo at default settings and resolution to see how they cope with day to day use. Each image was then compared to the reference drum scan and marked for colour, detail and resolution.

Another important measure of quality in scanners is tonal resolution. This represents the ability of the scanner to distinguish between fine variations in



This colour print has a variety of vibrant colours and fine detail, and is ideal for testing each scanner's resolution and image quality.

the brightness of an image. For this test we used a black and white photo by Miriam Stirling that had very fine gradients of grey, including 100 percent white and 100 percent black. This image was scanned using the scanner's best greyscale settings, but with no autoadjustment to gamma so we could evaluate the scanner's raw capability. The image was then loaded into Photoshop where we took a histogram reading, which showed how many pixels of each level of grey appeared in the image. If the scanner didn't accurately capture the full range of tones in the photo, the histogram was cropped at one or both ends. If the tonal resolution of the scanner was poor, then there were no readings at every grey level, resulting in a 'spiked' histogram. The numeric values for each scanner's histogram was

compared to the reference image, and the deviation determined.

It's sometimes tricky for a scanner, which is RGB by nature, to scan a CMYK print. If the scanner is not set to the right resolution, or the scanner's optics aren't uniform, the result can be an interference, or moiré, pattern. To test this, we scanned a 300dpi print of a past PC Authority cover at 600dpi to see if any anomalies arose, and rated each scanner accordingly.

Our final quality test was of the scanner's provided optical character recognition (OCR) software. We scanned the PC Authority OCR test document, which contained a variety of fonts and styles, along with a tricky watermark in the background that the software needed to distinguish from text. The scan was done at 300dpi, and run through the software, then checked in Word for errors.

We also tested for speed, by timing

the colour photo scan on default settings, the A4 text document as well as two 4 x 3 photo prints - one done at default settings, the other done on maximum quality settings.

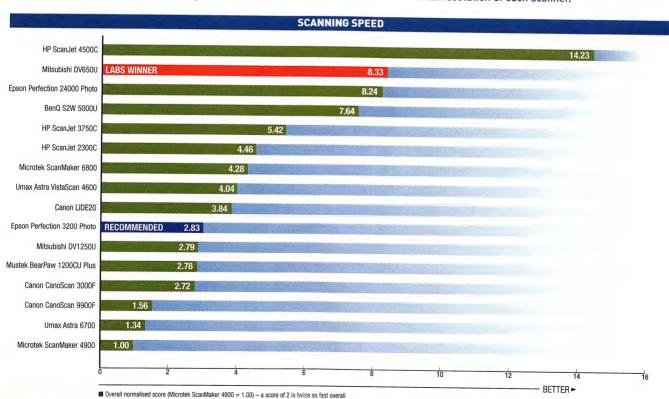
Once all the results were in, we tallied them together, weighted them and had a final result for each scanner that was used to determine the Quality star rating.

We also rated each scanner on its included features, which contributed to the Features star rating. Finally, the two results were weighted together, with 70 percent Quality, and 30 percent Features, with the price factored in to derive the Value Star rating with Overall being an average of the three.

Awards were given to the scanner with the best quality, and the one with the best overall value.



 $f \Phi$  This black and white photo is used to test the tonal resolution of each scanner.





DV650U **PRICE: \$149** 

**SUPPLIER: Mitsubishi (02) 9684 7777** INTERNET: www.mitsubishi-electric.com.au

A nondescript looking scanner that admits to a 36-bit colour depth, enhanced to 48-bit through its drivers.

At \$149, it competes directly with the Canon LiDE 20 and the HP 2300, both of which are 48-bit scanners. It also goes up against a low-priced BenQ that supports a higher resolution. While it loses some ground to these scanners on features, the DV650U hits the nail on the head when it comes to the crunch - it scans well.

The DV650U outperformed all other scanners except for its bigger brother, the Mitsubishi DV150U. In our tests, the DV650U recorded one of the lowest colourdeviations from our reference drum scans this means it was able to reproduce colours that were very close to the original, resulting in an almost perfect digital copy.

It also scored notably high for text, showing that the bundled OCR software produces excellent results. We found that the DV650U scanned very fast at low resolutions, and maintained a speedy scan at higher resolutions - here it squarely beat the high-scoring DV1250U.

We have to admit that until testing, the DV650U looked very plain and ordinary. It lacked the sophisticated design and sleek looks of some of the other candidates. Features are a bonus and a variety of options and add-ons will always come in handy, but a scanner should ultimately be able to do one thing well - scan.

It's one of the lowest priced scanners in our roundup - and when it came down to the hard numbers, the DV650U outperforms the more expensive and better featured scanners by a significant margin.

QUALITY	123456
FEATURES	
VALUE	
OVERALL	123456





Perfection 3200 Photo **PRICE: \$899** 

SUPPLIER: Epson 1300 304 767 INTERNET: www.epson.com.au

The Epson Perfection 3200 Photo represents absolute quality scanning for the serious amateur or professional user.

It uses a matrix CCD and micro lens to produce an amazing 3,200dpi optical resolution. Even though it wasn't the highest optical resolution scanner this month, standing behind both the Microtek 4,800dpi scanners, it still produced stunning results without long scanning times, care of USB 2.0 and FireWire.

The 3200 was only just behind the Microtek scanners in terms of colour accuracy, making it ideal for design work, where you need colour to be as close to the original as possible. It also managed to produce excellent skin tones. The black and white photo came out a little dark overall, although there was no spiking in the histogram, indicating it had good tonal resolution.

The Epson Smart Panel software offers three separate user modes from novice to professional, providing simple access to copy, photo print, scan to email and OCR, even allowing you to scan directly to PDF.

Included with the scanner is a bundle of professional software; including SilverFast SE a professional tool for removing dust, scratches and minor imperfections from your scanned images, as well as Adobe PhotoShop Elements, perfect for red-eye reduction touch ups, creating special effects and web animations.

An array of photo accessories adorns the package, including a 35mm film strip holder, slide and 4x5 inch film attachment.

While it is significantly more expensive than the Mitsubishi DV650U, the Epson 3200 has excellent image quality, a massive optical resolution and would make an ideal scanner for professionals and desktop publishing.

QUALITY	02945
FEATURES	123456
<b>VALUE</b>	023456
OVERALL	028460



S2W 5000U **PRICE: \$119** 

BENO

SUPPLIER: BenQ (02) 9714 6800 INTERNET: www.benq.com.a

The second cheapest scanner in our labs roundup this month, the S2W 5000U is designed with Web use in mind. As such, it features a 'Scan to Web' (S2W) and PDA (Palm compatible) quick launch function. This 1,200dpi resolution scanner managed reasonable quality results, although fell down a little in the colour accuracy and CMYK scan. Ideal for users after a budget but decent quality scanner at a shade over \$100.

QUALITY	123456
FEATURES	
<b>VALUE</b>	
OVERALL	023496



**PRICE: \$299** SUPPLIER: Canon 1800 021 167 INTERNET: www.canon.com.au

Another scanner to share the same software as the LiDE 20, Canon's 3000F boasts a jumbo sized Z-hinge for scanning of books and large bound documents helping to evenly light image scanning - great for students and perfect in conjunction with the quality results gained from the included OCR scanning software. For 1,200dpi, it's not too expensive, is well balanced between home and office use and gives great results.

QUALITY	123466
FEATURES	023456
VALUE	
OVERALL	123496



CanoScan 9900F PRICE: \$799

SUPPLIER: Canon 1800 021 167 INTERNET: www.canon.com.au

One of the larger form-factor units in this month's Labs, Canon's 9900F comes with a sexy mag alloy top coating and features a clearly labelled and attractive front control panel for easy single button press access. In addition to USB 2.0, it boasts FireWire connectivity and the very easy to use but advanced Canon scanning software package for previewing and editing your images prior to scanning.

QUALITY	AAAAAA
FEATURES	00000
VALUE	000000
OVERALL	00000
OVERALL	123456



LiDE 20 PRICE: \$149 SUPPLIER: Canon 1800 021 167 INTERNET: www.canon.com.au

The Canon LiDE 20 strikes a balance between quality and price. The scanner is well designed, with Z-hinges combined and the space-saving ability to stand upright. The easy-to-use CanoScan Toolbox software allows you to scan, copy and email with three front-mounted buttons: scanning, opening the default mail client and attaching the Web size-enhanced image. A brilliant budget unit with a price to match its tiny size.

QUALITY	000000
FEATURES	028466
VALUE	023466
OVERALL	00000

### **EPSON**

Perfection 2400 Photo

PRICE: \$549

SUPPLIER: Epson 1300 304 767 INTERNET: www.epson.com.au

Supplied with Adobe Photoshop Elements it features direct printing, scanning, email and Web quick launch buttons. At 2,400dpi The 2400 can give you exceptionally resolution scans, although overall quality was marred by some and detail issues in the colour tests, and some mediocre colour accuracy. The easy to use software is a bonus too, although at this price range, if image quality is your priority, go for the Mitsubishi DV1250U.

QUALITY	123466
FEATURES	023456
VALUE	028466
OVERALL	028466

# HEWLET PACKARD

ScanJet 2300c

PRICE: \$149

SUPPLIER: Hewlett Packard 13 23 47

INTERNET: www.hp.com.au

Not the most advanced scanner this month, featuring just two front shortcut buttons, the HP scan software is pure simplicity with many advanced options. Image quality was good though, especially in with the CMYK print and the text OCR.

It operates a little louder than other models although is well priced at \$149. Although Canon's LiDE 20 is a better colour reproducer for your photos.

QUALITY	023466
FEATURES	023456
VALUE	
OVERALL	023466

# PACKARD

ScanJet 3570c

**PRICE:** \$149

SUPPLIER: Hewlett Packard 13 23 47

INTERNET: www.hp.com.au

With a fantastically designed GUI, 35mm negative scanning attachment and gallery storage with a thumbnail view, this unit is hard to fault. The fast preview mode with autosensing software crops around your image to stop from scanning dead space, while the ability to upload to the Web or export your OCR images to rich text, HTML or PDF is a very welcome feature for intermediate, advanced and professionals users.

QUALITY	028466	
FEATURES	023466	
VALUE	023456	
OVERALL	000000	

# HEWLET **PACKARD**

ScanJet 4500c

PRICE: \$449

**SUPPLIER: HP 13 23 47** INTERNET: www.hp.com.au

A 2,400 x 2,400dpi flatbed scanner, features an LCD and one-touch front panel buttons for printing/copying, emailing, burning and sharing images. Image quality was well below average though, especially when it came to colour accuracy.

Supporting an Automatic Document Feeder and TMA (for 35mm negatives), the 4500 is beaten by the Microtek ScanMaker 4900 which costs \$50 less.

QUALITY	020000
FEATURES	023456
VALUE	020466
OVERALL	02006



ScanMaker 4900 PRICE: \$399

SUPPLIER: Proscan 1300 132 001 INTERNET: www.proscan.com.au

The Microtek ScanMaker 4900 offers a high resolution of 4,800 x 2,400dpi and decent performance for a fair price. Unfortunately only having USB 1.1 puts it behind the leaders, and results in some very slow scan speeds. It does, however, share the pushbutton convenience of the HP 4500, and features a button to create PDFs. The ScanMaker 4900 also comes with an attractive software bundle.

QUALITY	123466
FEATURES	123456
<b>VALUE</b>	123456
OVERALL	123456



BearPaw 1200CU Plus **PRICE: \$99** SUPPLIER: Natcomp (02) 9712 0099 INTERNET: www.natcomp.com.au

Although it's a 600 x 1,200dpi scanner and only 36-bit colour, this was the only unit in our round-up under a hundred dollars. This USB-powered lightweight CIS scanner did well in the looks department, with an excellent build quality for a small cost. It also has a vertical stand for storage. Performance was poor compared to the more expensive scanners, however, unlike them, the BearPaw 1200CU operates with Windows and MacOS.

QUALITY	123466
FEATURES	- the time to the
VALUE	
OVERALL	000000



ScanMaker 6800 **PRICE:** \$999

SUPPLIER: Proscan 1300 132 001 INTERNET: www.proscan.com.au

Featuring an optical resolution of  $4,800~\mathrm{x}$ 2.400dpi, the 6800 is the most expensive scanner in our roundup. Microtek markets it as a mid-range or corporate scanner - with good reason. It supports both USB 2.0 and FireWire, and has hardware technology known as 'Digital ICE' which claims to restore dirty or damaged original prints. It also has built-in transparency adaptor that will let you scan in 35mm film. It's thick and heavy, but still looks good.

QUALITY	123456
FEATURES	123356
VALUE	023460
OVERALL	028499



UMAX Astra 6700 **PRICE: \$499** 

SUPPLIER: AIM Digital Imaging 1800 008 899 INTERNET: www.ausmedia.com.au

The 2,400 x 4,800dpi Astra 6700 offers good core functionality without many special features. Despite this, it's a good performer, scoring strongly against all other scanners in our tests and besting the HP 4500 and Epson 2400, also in its price-range. Although it's a rather longish scanner, it doesn't provide any additional surface for scanning. There are buttons for emailing and copying, and though the base feels solid, the lid is flimsy.

QUALITY	028496
FEATURES	123456
VALUE	123356
OVERALL	123456



DV1250U **PRICE: \$269** 

SUPPLIER: Mitsubishi (02) 9684 7777 INTERNET: www.mitsubishi-electric.com.au

A glance at the plain DV2150U with its optical resolution of 1,200 x 2,400dpi in no way reveals what it's capable of. It outperformed every scanner in our roundup, with consistent results across the board and superb colour accuracy. Features-wise, it trails the HP3570C, capable of 35mm negatives. If you're fussy about performance you can't go past this scanner. At \$269, it is also excellent value for money.

QUALITY	028456
FEATURES	023966
<b>VALUE</b>	123456
OVERALL	023460



VistaScan Astra 4600

**PRICE: \$230** 

SUPPLIER: AIM Digital Imaging 1800 008 899 INTERNET: www.ausmedia.com.au

The Astra 4600 offers excellent performance for a low price. In the 1,200dpi class, it outscored all but the Mitsubishi DV1250U which costs \$70 more. It managed high scores in both colour and tonal resolution.

BenO's unit is less costly, but its performance cannot compare with that of the Astra 4600.

The chassis also has a set of buttons to automate copying, emailing etc.

QUALITY	028466
FEATURES	123456
VALUE	023456
OVERALL	023456

# Harvey Norman









**\$590** 

1 LG

PHILIPS

SONY

LG 15" Flat Panel Display.

Maximum resolution: 1024 x 768@75Hz, contrast ratio: 300:1, viewing angle: 90°(H)/120°(V), 1510S Phillips 15" Flat Panel Display.

Maximum resolution: 1024 x 768@75Hz. contrast ratio: 400:1, embedded power supply. Sony HS Series 15" Flat Panel Display. Maximum resolution: 1024 x 768@75Hz, contrast ratio: 350:1, viewing angle:







Acer 17" Flat Panel Display.

Maximum resolution: 1280 x 1024@75Hz, contrast

ratio: 700:1, viewing angle:  $170^{\circ}(H)/170^{\circ}(V)$ .

acer

**PHILIPS** Phillips 17" Flat Panel Display.

Maximum resolution: 1280 x 1024@75Hz. contrast ratio: 400:1, embedded power supply. 170S4FS

SONY

Sony HS Series 17" Flat Panel Display. Maximum resolution: 1280 x 1024@75Hz,

contrast ratio: 400:1, viewing angle:  $140^{\circ}(H)/150^{\circ}(V)$ , modern, floating panel design, 3 year warranty, SDMHS73GREY





**PHILIPS** 



**69** 

▼18" & 19

( LG

Phillips 18" Flat Panel Display.

Maximum resolution: 1280 x 1024@75Hz, contrast ratio: 350:1, auto adjustment for optimum picture quality. 180P2G

SAMSUNG

Samsung 19" Flat Panel Display.

Maximum resolution: 1280 x 1024@85Hz. contrast ratio: 500:1, viewing angle: 170°(H)/ 170°(V), DVI and Analogue inputs. 19175 19070

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# **DIGITAL DILEMMA**

We investigate the best way of getting an image onto your PC.



hey said the scanner was dead, that digital cameras would take over the computing world. But things aren't that simple. You may have all the software on your PC for editing your photos, but what's the best way of getting an image into your computer? How do you digitise the visual world?

Digital cameras have certainly led the charge in this area of late, but studies and experts suggest the scanner isn't dead as a method of importing images. Research shows that for every digital camera in the world there are millions of old photos. In archiving terms alone, the scanner has a place at the head table at the digital photography party.

Many people even argue that a scan from a print or transparency taken on a traditional camera is of better quality than a mid-range digital camera shot. The basis behind the argument is that the resolution of film is better than all but the very best (and expensive) digital cameras. Therefore the image-capture capability of film is better than most digital cameras.

Many photographers argue the image loss between scanner and computer is so minimal that scanning from film will produce sharper images, although as digital camera technology improves that argument will become more contentious.

It's an issue in photography circles, with two distinct schools of thought both equally viable.

Much of the debate centres around the

64-megapixel question: 'How many pixels do you need in a digital camera to achieve the same clarity found in film?'

It's an argument that's been circulating since digital cameras came to market ten years ago.

The problem with this question is that film is an analog medium and so doesn't have pixels that can be easily measured. Comparisons can and have been made, but these remain largely subjective.

However, it's almost universally accepted that even the best consumer digital cameras don't come close to replicating the image quality of a decent 35mm SLR camera. Only once you start getting into the 6-megapixel territory are professional images possible. Not many people, however, have that kind of disposable income to spend unless they make their living from taking photographs.

Estimates vary widely, depending on the researcher's stance, but there are up to 14 million 'pixels' in a good-quality 35mm shot using a tripod and with good light and correct settings. That figure can drop to a million as poor light, hand shake and focusing problems come into play.

The pixellation in digital pictures is likely to be more dramatic than chemical grain, which can be seen when 35mm prints are enlarged.

Clearly, the top end of this scale is far higher than most readers' digital cameras, and another factor is that film isn't restricted by the 256 greyscale and the limited colours we find in digital cameras.

### QUESTION OF COST

Personal preference is one issue, but part of that preference will always involve cost. One thing that's certain in this vague and

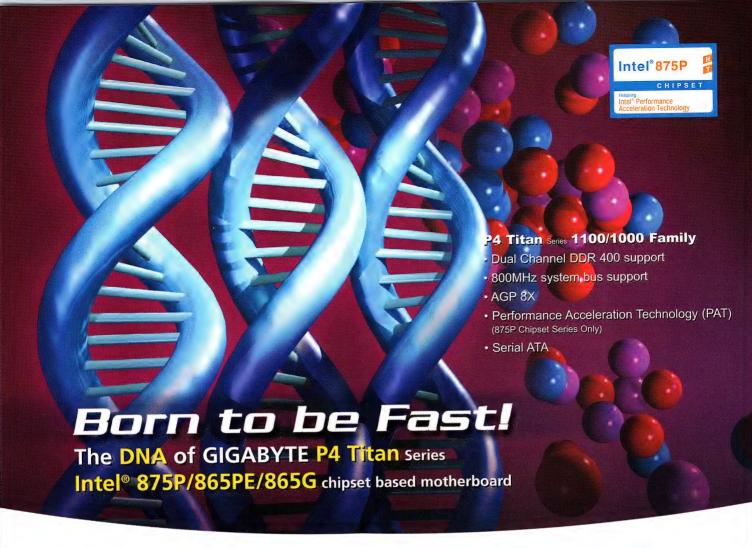
## DO-IT-IN-STORE

Post-scanning, post-downloading or post-manipulation, there's the question of whether or not you want your images stored digitally or printed out.

We reviewed some photo printers in a previous Labs (January 2003) that do the job, but if you aren't in the running for a photo printer, one of Kodak's photo-printing kiosks might be what you're looking for.

The self-serve Picture Maker kiosks can be used to download, edit, adjust and print photos from card media while you wait, and the Photo Teller kiosks allow you to select images for printing from a digital image lab.

These kiosks can be found in Kodak Express stores and K-mart, which is interesting as it shows even the old-school film companies are keen to push digital technology out to the masses.



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### New Zealand

64-4-560-9100 Checksun New 64-9-579-8832 subjective area is for image quality of digitising, you get a better deal, dollar for pixel, with a scanner.

However, if your decision is purely financial, there are many arguments for taking the digital camera route. Obviously, film and processing costs disappear, allowing you to shoot to your heart's desire, capture more images and potentially better pictures.

Many photography tutors recommend digital cameras as a way of learning composition cheaply, but once these techniques are mastered students often revert to film to achieve greater clarity.

Not everyone, however, is convinced that digital cameras necessarily produce poorer qualities, except when printing to a larger format.

### **DATA ISSUES**

Other considerations include the different ways the image data is treated by both the scanner and digital camera on its way to your hard disk. This is because scanners try to mirror exactly the colours on the original with a pixel-by-pixel representation, while digital cameras still interpolate some of the image data.

On the scanner, even with 8 bits per colour, you get 24 bits of data for every single pixel. Many digital cameras only get 8 bits of data per pixel and interpolate the other 16. Colour accuracy on many scanners can therefore be much more accurate, although digital cameras are improving. There are, however, file-size considerations involved here and scanning at high resolutions can consume huge

swathes of your hard disk.

### CONCLUSIONS

Given there are so many compelling arguments for both approaches to digitising your memories, the best solution may be to opt for a combined approach. You might want to buy a scanner for high-quality images and archiving old pictures, but also carry a digital camera for holiday snaps and other occasions where simplicity is more important than quality.

With so many scanners in this month's Labs coming with film-scanning accessories, another consideration is whether you should be scanning from film or print. Much depends on the quality of your media.

Stewart Mitchell

### **ANTIQUE IMAGES**



There's been much debate regarding how much damage is done to old photographs by being exposed to the strong pulses of light the scanners use. According to photography expert, Jon Tarrant, it's a very important issue.

'Old pictures do suffer from being scanned, but because once you've scanned that image it can be locked away safely, archiving is worth the risk,' said Tarrant. 'Once it's out of the way, you have a permanent record and you can store the original somewhere safe.'

### **CAMERA SCANNING**

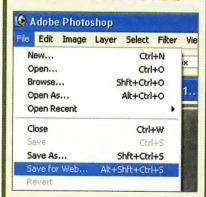


The argument between the use of scanners and digital cameras is further clouded by the fact it's possible to use a good-quality digital camera, particularly one with macro capabilities, to copy from prints.

Effectively, by taking another picture of a photo, a camera can act as a scanner.

'More and more professionals are now using a digital camera as a method of copying, instead of using a scanner,' said Tarrant. 'But for most people, actually doing this without getting reflections from around the room is difficult and time consuming.'

## **IMAGE CONSCIOUS**



Another key consideration to the choice between scanned and digital is your planned output method. Given that images posted to the Web, for bandwidth reasons, shouldn't exceed 72-100dpi and that most monitors only display at 100dpi, any higher resolution would be a waste. Here a low-end digital camera would definately suffice.

However, where scanners really come into their own is for copying or enlarging prints. The high optical resolution of many of the scanners in this month's Labs, up to 2,400ppi, can produce photos with virtually no quality loss.

# **SCANNING TECHNOLOGY**

We investigate how scanners work and the key ingredients of an excellent unit.

ll but one of the scanners on test this month use a combination of a light source, a colour-separation method and an array of CCDs (Charge Coupled Devices) to capture the required image. The light source is usually a cold-cathode bulb. This differs from a normal light bulb in that it has no filament, generates very little heat and provides a consistent white light for longer, giving much better results. Some of the latest scanners use Xenon bulbs, which have similar characteristics to their coldcathode counterparts.

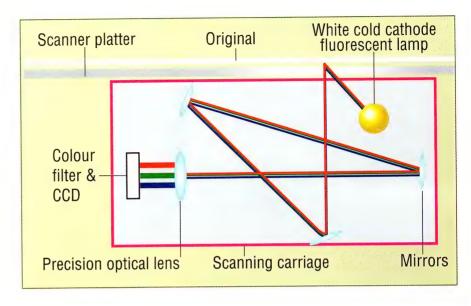
Colour separation is achieved through a lens that splits the incoming light into three channels: red, green and blue. These then pass through a colour filter onto a discrete section of the CCD array. The scanner combines all the data to form a single, fullcolour image.

The CCD records the lightness of the reflected or transmitted light as an intensity, which can then be translated to a colour value. The intensity is proportional to the number of photons captured in a given time period. A higher intensity comes from more light being reflected, or transmitted in the case of film scans, by the original document or image. Black gives the lowest intensity, while white gives the highest.

When the scanner scans an image, the bulb illuminates a thin strip of the image called a raster line. The reflected or transmitted light is captured by the CCD array and converted to a set of digital values. In a 1,200ppi A4 flatbed scanner, where the scanning width is 216mm, there are 10,200 (8.5 x 1,200) usable CCD elements in the array. As the array is a lot smaller than 8.5in wide, an optical system, comprising prisms, mirrors, lenses and other components, focuses the light from the raster line down to the appropriate size of the array.

This covers the horizontal resolution, but the smallest distance the scanning carriage can move determines the vertical resolution. In many of the scanners on test here, the carriage is able to move 1/2,400in, giving a 2,400ppi vertical resolution.

The quality of the optical system can vary considerably between scanners, with highquality models using colour-corrected glass optics, for example, while low-end models



may use plastic components to save money.

### CIS vs CCD

One scanner on test, the Canon LiDE 20, doesn't use an array of CCDs. Instead, it uses another technology called CIS. Standing for Contact Image Sensor, a CIS array consists of tightly packed arrays of red, green and blue LEDs, which are used to produce a white light.

The optics of a CCD-based scanner are replaced with a single row of sensors, which are mounted close to the source image. The benefits of CIS are that it allows thinner and lighter scans to be produced, which are also more energy efficient, allowing them to be powered across USB without an additional power supply. This Labs' sole representative of CIS technology, Canon's LiDE 20, managed to perform above average overall, showing CIS technology has a strong future.

### **BIG NUMBERS GAME**

We've already covered the importance of resolution, but it's also meaningful to differentiate between optical and interpolated. Whereas optical resolutions are determined by the CCD and the distance the scan head moves, interpolated resolutions use algorithms to generate the extra pixels based on the colours of the existing pixels in the actual scan. This leads to blurrier images that consume even more space - hardly

worth the effort, except for the scanner manufacturer's marketing department.

Similar arguments apply to bit depths. This refers to how accurately a scanner can describe the intensity of each pixel. Theoretically, the higher the bit depth, the better the final scan. Most of the scanners on test boast 42 or 48-bit depths, which is 14 or 16-bit per colour - red, green and blue. As most image-editing applications can only cope with 24-bit colour, having the extra six or eight bits per colour isn't that useful. However, applications can use the extra information to correct noise in the scan, and you can also more accurately set luminance values and other image settings in the scanner's driver.

Optical density range - or dynamic range - is similar to the bit depth. It refers to the range of tones that a scanner can recognise and record. This is most important when scanning transparencies, but is far less relevant for reflective scans.

As manufacturers quote many of these near-meaningless - yet impressive looking - figures on their packaging, it's important not to be persuaded that bigger is better. If you want to ensure that you buy the bestquality scanner, only exhaustive testing from independent sources such as PC Authority truly sorts the best from the merely good.

Jim Martin





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Can you realistically give Bill Gates the boot? Or is Microsoft the only option for PC users? PC Authority looks at the alternatives.

Microsoft's arguably heavy-handed approach to licensing, and with a culture that favours the underdog, the open-source and free software community reckons there has never been a better time to try alternatives to Microsoft. The problem is that most people only know how to use Windows and its associated applications. There are others out there, some of them good, but the perceived wisdom, particularly in business, is that Bill Gates remains king.

### **FIRST THINGS FIRST**

The OS is your first port of call if you want to give Microsoft the flick. The OS debate is old and tired and unfortunately results in subjective sideline cheering for their favourite team. It's without a doubt one of the holiest of holy wars, and one which we're not going to enter into in any sort of detail here, but we can sum up the important points and then give you a few absolute certainties.

Firstly, there are really three main players. UNIX, and its BSD and Linux cousins, make up a large portion in the corporate space, but haven't yet made a dent in the desktop space. It's configurable, scalable, flexible and enjoys an unbeatably hip, left-wing philosophical bent.

There are hardcore alternatives like Slackware and Debian, which require a lot of effort to get going. The stable, well-supported and user-friendly variants like SuSE and Red Hat; and the even-your-grandmother-could-use-it distributions like Lindows. Most distributions are free, but if you want the support of some proprietary standards and applications you'll have to pay for it.

Apple's MacOS X comes up next, but doesn't enjoy as much penetration as it probably deserves. While based around a free BSD core, it's anything but free and you've got no choice but to buy Apple's hardware along with it. What it lacks in physical grunt, it makes up for with a great user interface, funky presentation and a tight community. But considering you have to do away with your current PC, we'll leave this alone for now.

Finally, we've got Windows itself. There's a damn good reason why it's the most popular operating system and that's simply because it is the most popular operating system. It doesn't really do anything better than it's competitors, but it has excellent software support,

hardware support, an ever-expanding community of certified technical engineers and a company behind it with very deep pockets. It comes in many flavours, the latest version being by far the most stable version, but you can expect to pay top dollar for it.

Whatever your choice in operating system you can still remain as Microsoft-free as you need to. With experts in the field in all areas looking at the options, *PC Authority* brings you the definitive guide to the alternatives.

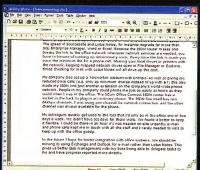
### **OFFICE SUITES**

Microsoft Office has about a 90 percent share of the office productivity market, but it isn't the only game in town. Several companies offer alternatives and many of them are cheaper, some even free, but are they any good? Settling for a cheap alternative to Microsoft Office may cost you more in the long run, with compatibility and usability the main concerns, particularly in business.

If you use one manufacturer's office suite, can you exchange files with someone using a different suite? Can you see all the formatting, and do the files print correctly? Some suites claim compatibility with others but have long lists of formatting and features that are only partially supported or not supported at all. You may not find out what these restrictions are or whether they'll affect you until you actually use a suite in anger.

How easy is it to use the applications? Are the menus and toolbars self-explanatory? Can you find the tools you need, especially ones you don't use often? The quality of the help text can vary enormously. Good help text can make all the difference when you get stuck.

Products such as CrossOver Office (www.codeweavers.com/products/office) allow you to run Microsoft Office 97 or 2000 under Linux. It may also work with other Windows applications, but they won't be supported by CodeWeavers. If you're looking for an all-in-one solution, SuSE Linux Office Desktop includes CrossOver Office and Sun StarOffice along with the Linux Kernel 2.4.19 and the KDE 3.0.4 and GNOME 2 desktops. For more details, visit www.suse.com/us/private/products/suse\_linux/office\_desktop/index.html.



Ability Write: not brilliant, but cheap.

### **ABILITY OFFICE**

Ability Office was originally released for DOS in 1985. The word processor in Ability Office is called Ability Write. It has a reasonable feature set including styles, textboxes, tables, headers and footers, templates

and even a macro language based on VBScript.

However, it can't show the names of fonts in the fonts themselves, nor does it have the ability to create tables of contents, indexes or cross-references. The menus and toolbars are pretty comprehensive and customisable, but importing Microsoft Word documents is patchy. Some opened with few differences from the original, but there was a tendency to mangle styles. Others gave 'out of memory' errors and messed-up formatting. Some Word documents opened to show only a blank page.

Ability Spreadsheet looks a lot like an early version of Excel. It features plenty of maths, financial, stats and trig functions, but its import capabilities are limited. We couldn't find a method of getting external data into a spreadsheet nor any PivotTable or PivotChart facilities. As with the word processor, there's a macro language and you can even design simple data-capture forms.

Ability Database will create or open Microsoft Access MDB files. Tables and queries in existing Access files are accessible, but not the forms or reports. The Ability forms, reports and macro language all look competent, though.

Draw is a mixed bitmap/vector drawing package. It has basic facilities (box, circle, line, freehand, text, group, colour and so on) and outputs PNG, JPG or its own AWG format.

PhotoPaint is a bitmap image editor with lots of selection and drawing tools as well as an impressive array of transformation filters such as blur, sharpen and windblown. It can save and load a wide variety of image formats too.

### **COREL WORDPERFECT OFFICE 2002**

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Quattro Pro: good features, unfortunately poor importing.

WordPerfect was once the best DOS-based word processor on the market. It came severely unstuck with the advent of Windows, though, and has struggled to keep up with Microsoft Word ever since.

It offers lots of layout features, textboxes, images,

text wrapping and tables, and toolbars are both movable and customisable. Plus, it features spelling and grammar checking as you type, as well as two macro languages (its own recordable macros and Visual Basic for Applications).

But some features are hidden or it isn't obvious how they

should be used. Help text is a bit patchy too: for example, the article 'Adding a table of contents to a document' doesn't tell you how to do it. For that, you need to find the article 'Defining a table of contents'.

WordPerfect makes a good stab at opening files in rival formats, but doesn't always get it right. For instance, it consistently mistranslates subtle colours into bolder ones when opening Microsoft Word documents.

Ouattro Pro is a fully featured spreadsheet application with all the functions, graph-drawing, formatting and data-manipulation features you could want. It also features what-if, optimisers, solvers and PivotTable tools. However, some of the more advanced features could be a little easier to use and, again, the help files need to be better.

Help appears to be fragmented, with bits appearing in different windows. Quattro Pro makes a decent attempt at opening Excel workbooks, but complex things like PivotTables aren't live after import and some graphs don't display. We had one Excel file that consistently crashed Quattro Pro.

Corel Presentations 10 is a competent presentation graphics package. However, the range of master templates is limited and a little old-fashioned. Also, there's no help for getting a consistent style or format to your slides. Importing Microsoft PowerPoint files isn't perfect either. Some objects appear in the wrong place or with the wrong colour.

Corel Central is the PIM (personal information manager) and Mail application for WordPerfect Office. It appears as several unconnected applications, none of which are easy to configure or to use. The Professional Edition of WordPerfect Office includes the Paradox database application too.



Lotus Freelance: staid backgrounds.

### LOTUS **SMARTSUITE** MILLENNIUM **EDITION 9.8**

SmartSuite has hardly changed since we last looked at it three years ago. WordPro, the word processor, has almost all the features you could want, including spelling and grammar checking, outlining, tables, columns,

images and embedded objects. The active status bar at the bottom

## OFFICE SUITES COMPARED

OFFICE SUITE	PRICE	WORD PROCESSOR	SPREADSHEET
Microsoft Office XP	\$304 (academic); \$1,072 (standard); \$524 (upgrade)	✓	✓
Ability Office 2002	\$106 download/ \$120 CD	✓	✓
Corel WordPerfect Office 11 Professional	\$450 full; \$225 upgrade	✓	✓
Lotus SmartSuite Millenium 9.7	Download: \$455 (full) \$341 (upgrade)/ Boxed: \$497 (full) \$372 (upgrade)	✓	✓
Sun StarOffice 6.2	\$160	✓	✓
OpenOffice.org 1.0	Free	✓	✓

of the window gives quick access to commonly used formatting functions. However, menus could be more logically arranged and the toolbar buttons aren't particularly clear. WordPro does a good job of opening Microsoft Word documents, although colours can be off and page breaks may not be in the same places.

1-2-3 is the granddaddy of all spreadsheet applications, offering lots of good features and functions. It shares many features with WordPro, including the same macro language, info boxes and active status bar. The menus and toolbars are just as confusing too. Also, 1-2-3 can open simple Excel workbooks but may refuse to open ones using more complicated features.

Freelance, the presentation graphics package, appears to be stuck in the 1980s. The selection of backgrounds is staid and uninspiring, and you have to laboriously scroll through each one to see it previewed before selecting.

Formatting, transitions and animation are handled well, but importing from Microsoft PowerPoint files can be a problem. Freelance will do its best with PowerPoint up to version 8 - Office 97. Graphics and animation in imported files will probably need to be tidied or recreated too.

The Lotus Approach database application has very little to recommend it. It's difficult to use, confusing and non-standard. Organiser is Lotus? PIM application and presents data as though it were in a paper organiser. It connects to absolutely nothing and has no email capabilities.

FastSite is Lotus/IBM's attempt at a cut-down/simplified version of FrontPage. It aims to produce Websites from a set of SmartSuite documents, but it is dated and awkward to use. It also hasn't been updated since 1999.



# Star Writer: reads Microsoft Word files well.

### SUN STAROFFICE

Writer is a competent word processor. It offers good formatting capabilities with picture wrapping, tables, fonts, styles and automatic spell checking but no

grammar checking.

The help text is genuinely helpful and not fragmented and. although the user interface looks a little old-fashioned, the toolbars are customisable to show the tools you want.

Writer opens Microsoft Word documents, even complicated ones, with few problems.

Calc is a fully featured spreadsheet application. It offers a large range of functions and formatting, and can even read OLAP (On Line Analytical Processing) data from external data sources. It reads Microsoft Excel files as well, usually without problem, including those that use conditional formatting. It also has a good range of chart types, and help on features and functions is easy to find and read. There's a macro language as well, which is like VBA, but no macro recorder.

Impress presentation graphics are handled competently, even though the user interface is a little awkward in places, with floating windows that can get in the way. The range of backgrounds and styles is impressive, but some look a little tired and others don't follow good practice. However, Impress can open Microsoft PowerPoint presentations with few problems.

Draw is a combined bitmap and vector-drawing package. It is big and quite complicated to use, but offers lots of 2D and 3D effects that are explained quite well in the help text. Also, the Math applet lets you create mathematical formulas for inclusion in your other documents.

Overall, not a bad suite, with all the basics, and some nice features, although not as many bells and whistles as Office. Given the price though, it's far better value than Office - but we would question why you would use StarOffice given that OpenOffice is free, and has just about all the same features.

OPENOFFICE.ORG 1.0.2
Sun has donated the code from StarOffice to the OpenOffice project. OpenOffice can be downloaded free from www.openoffice.org and will now be maintained and upgraded by a variety of developers. Given this, it's by far the best value option and you can even try it for yourself on this month's cover CD.

### CONCLUSION

So do any of these competing packages match up to Microsoft's offering? Ability Office is the cheapest and it shows. It doesn't have the features to compete with the larger suites, but if it does all you want it to and you don't need to exchange documents with other people it might be right for you.

Sun's StarOffice offers much better facilities for about the same cost as Ability Office, but the free version, OpenOffice, does almost as much and can't be beaten on price.

Lotus SmartSuite used to be a contender, but with no real development work for three years it looks like IBM/Lotus is going to let it die. This is a pity, as Lotus WordPro is a nice word processor, even if the rest of the suite is a little tired.

### DATABASE | GRAPHICS | ORGANISER | MS COMPATIBLE | LINUX PRESENTATION I × √ (older versions only) ×

### **GOT LINUX?**

These office suites run only on Linux:

KOffice www.koffice.org

This is the office suite for the KDE desktop.

• GNOME Office www.gnome.org/gnome-office GNOME's desktop office suite.

Corel WordPerfect Office has most of the features, but seems awkward to use compared with Microsoft Office. Ultimately, you pay your money and you make your choice.

Microsoft Office is still the best suite for features and usability, and Office 2003 builds on this already substantial base by broadening the concept of an office suite to take the actual 'office' into account, and not just the individual, which has potentially huge advantages for medium to large businesses.

There are alternatives out there if you want them, but Microsoft still has the edge in just about every department. Our advice: if you are eligible for an academic license for Office, it's by far the best option. If you can't, and you don't want to pay over a grand for Office, then StarOffice is a good choice, while OpenOffice is the best value bar none.

### **EMAIL CLIENTS**

For all intents and purposes, Microsoft has the consumer email client wrapped up, with LookOut Express supplied ready to run with Windows itself. Why did we call Outlook Express that? Well, anyone who reads the IT news will have heard about the package's vulnerability to security threats.

If you want a long-trousered combination of flexibility and functionality, packaged with security and privacy in mind, as a power user you have to look beyond the Microsoft 'toy' client. Of course, start installing alternative clients and you often reveal their buggy, incomprehensible user interfaces or are confronted by 'bloat' that's out of proportion to task.

Increasingly, coders from the former Soviet Union are leading the way in application development in the online sector. In the case of email clients, this means The Bat! from Ritlabs

THE STATE OF STREET STATE OF THE

The Bat! has a strong feature set and good street cred.

(www.ritlabs.com), which has a lot going for it, not least of which is the test of time, and has had most of the bugs ironed out and built up a helpful and knowledgeable online community should you ever need assistance.

Unusual in many respects - it isn't free for a start - it manages that difficult task of getting the balance right between what some users expect and

others dream of.

Notably, there are some useless aspects like the mail ticker, which has been switched off since the day it was installed, but, apart from that there aren't many other annoyances.

Highly useful features include an integral backup function to ensure your messages, bases and settings remain safe in case the worse should happen (we've tested this to ensure it works in a real-world situation, and it does). A synchronise facility makes keeping two client message bases easy enough, and the high level of filtering with almost endless advanced options doesn't hurt either.

Unlike Outlook Express, the default HTML message view only displays the downloaded content and doesn't connect externally to go fetch potentially dangerous stuff. Running multiple POP3 accounts is easy, and a message preview feature will let you sort your mail on the server before downloading. There's also an antivirus checking function in the latest releases, which works with an antivirus software plug-in to keep your message base sterile.

If that wasn't enough, and for us it wasn't, of course, you can upgrade to the rather more expensive SecureBat!, which keeps the OpenPGP and S/MIME support of the original and adds a hardware implementation of CRAM-HMAC-MD5 authentication used with POP3/SMTP by way of an iKey USB hardware token. This ensures only you get access to the software and brings on-the-fly encryption of message base, address books and configuration files to the party.

Other than Ritlabs, we also looked at two other popular non-Microsoft email clients. Pegasus Mail (www.pmail.com) is possibly the email client with the most consistent and longest history, remaining pretty much the same with regard to its simplicity of use and underlying power. It was the client that pioneered email filtering back in 1991 and remains one of the richest featured applications in this area today.

You get SMTP, POP3, IMAP4 and LDAP support out of the box, multiple mailbox functionality, built-in encryption or PGP by way of a plug-in, selective downloading/previews, and probably the best help file (at more than 300KB) of any client -Microsoft included.

However, the real power of this client becomes more apparent when you combine it with the Pegasus Mercury mail server to provide an integrated mail management system. Quite amazingly, given the pedigree of both products, these are free to download and use.

The other big player - and with three million users of the ad-sponsored version, it can justify that tag - is Qualcomm's Eudora. Another well-established client with roots back to the start of the 1990s, Eudora is fully featured as is, but you can pay

## **EMAIL SUITES COMPARED**

EMAIL CLIENTS	PRICE	MESSAGE FILTERING	SPAM FILTERING	SMTP
Outlook Express	Free with Windows	<b>√</b>	x	<b>✓</b>
The Bat!	\$38 (student); \$53 (private); \$68 (business)	✓	×	✓
Pegasus Mail	Free	✓	✓	✓
PocoMail PE	\$59	✓	✓	✓
Eudora 5.2	Free (ad-sponsored); \$60 full version (download)	✓	✓	<b>✓</b>
Mozilla Thunderbird	Free	✓	✓	<b>√</b>

a licence fee to get rid of the advertising guff.

This is highly recommend if you want to use Eudora, as those ads become intrusive after a while (a 'lite' version is available free of charge, but this suffers from a rather sparse feature set). What you're left with is one of the most user-friendly of the non-



Pocomail has a slick interface and also offers an alternative, portable media-only version.

Fron	Pick Up Your Email nany computer, anywhere in the world. No need to register!
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Microsoft mail clients and one that competes most directly with Outlook Express.

Advanced features include filtering to match addresses against the contacts book, Kerberos V authentication support, drag-and-drop functionality for moving attachments out of the client, and even warnings of possibly offensive message content – either

incoming or ones that you've angrily punched out before recklessly hitting the send button.

Syncing issues for family/workgroup users are dealt with by the proprietary Eudora Sharing Protocol, and there are even graphical representations of your usage stats.

One of the stronger features is the excellent importing

of messages and contacts from other clients, which is useful when switching a long-established application for another.

Another Outlook Express replacement to look out for is Mozilla's standalone mail client, Thunderbird. Still in early beta, it features the standard Mozilla mail feature set, but claims a smaller memory footprint than Outlook and Mozilla. Check out the free download at www.mozilla.org/projects/thunderbird.

For a mobile solution, take a look at PocoMail 'PE' (www.pocomail.com), which stands for Portable Edition. This

POP	IMAP	SSL	LINUX
<b>V</b>	<b>V</b>	<b>V</b>	×
<b>√</b>	V	1	×
<b>√</b>	V	V	×
<b>V</b>	<b>V</b>	×	×
<b>√</b>	V	1	x
<b>✓</b>	1	V	<b>V</b>

## ON THE CD

- The Bat! 1.62r
- Ine Bat! 1.62
   Eudora 5.2
- Pegasus Mail 4.11
- PocoMail
- Mozilla Thunderbird
- Gordano Messaging Suite

offers secure mail for use on a USB Flash drive, Microdrive or even an Apple iPod. At \$59 (\$US39.95) it isn't cheap, but it does provide all the functionality you could require and leaves no trace of your activity behind (we've checked the Registry and found no footprints on the temporary host machine).

If you don't mind using a Web browser to check mail, you may already use Hotmail (www.hotmail.com), but this is a Microsoft-owned product so for the purposes of this feature we must look elsewhere.

I favour sticking with my POP3 mailbox and just using the Web browser to access it remotely, and the best tool for this job is mail2web (www.mail2web.com), which offers a secure login and costs nothing to use. You can opt to leave your messages on the server to keep your desktop messagebase in sync, which is rather handy.

Finally, if you're looking for a corporate-strength solution, we found ourselves veering towards the Gordano Messaging Suite (www.gordano.com), which many readers may remember in its previous life as NTMail. This brings shared calendaring, SMS texting, antivirus tools and spam filtering to the office mail party and provides a real alternative to the standard Microsoft Exchange/Outlook route.

It offers a healthy mix of high availability with low maintenance, and for anyone with total cost of ownership as the bottom line the Gordano Messaging Suite comes underscored and highlighted.

### **BROWSER CLIENTS**

There's no shortage of alternative Web browser clients, only a shortage of ones that work well. The problem is one of standards compliance. While Microsoft isn't the winner of any best practice awards from the W3C perspective, in the real world Microsoft has a market share of 95 percent when it comes to Web browser clients and so can pretty much write the rulebook. And that's what it has done. Forget the rights and wrongs of this and just accept it as the ugly truth.

Other more officially compliant clients will therefore inevitably fall over or fail to render pages correctly when confronted with Microsoft standardised coding.

So what are the options available to you if you want to look elsewhere while browsing? It boils down to just three clients, or two if you admit that Netscape 7 (www.netscape.com) and Mozilla 1.4 (www.mozilla.org) are the same beast wearing slightly different clothes, Opera (www.opera.com) being the gooseberry in this particular ménage a trois.

Mozilla manages to pip Netscape for the more grown-up of the two Gecko engine-based browsers, thanks to it being more customisable, able to deal with pop-up ad blocking in an intelligent manner, and not insisting that you install the proprietary Instant Messenger client as Netscape does. Otherwise, they're much the same under the skin and the result of four years of open-source development. This should be a good thing, but because of the real-world standards issue the waters have become rather muddied.

But if the clunky Mozilla suite isn't what you're after, there's yet another option in the Gecko world – Mozilla's offshoot, the



client, Firebird simply takes out the browser portion and strips out anything

unnecessary. It also has solid support for plug-ins so you can put back the functions that you want and a good community focus to bring it up to speed.

Although it's still in early beta form, we think it'll replace Mozilla as the open source browser of choice.

But in order to stand any chance of making a significant dent in the Microsoft Web monopoly, the Gecko clients need to have a better core-rendering engine, but they don't.

With page rendering speeds about the same as Internet Explorer, but with added compatibility problems thrown into the mix, it's difficult to make any kind of business case for switching browsers.

On the upside, both Netscape, Mozilla and Firebird are free, unlike the third option, Opera. This is a twist of fate, because Opera 7 is the best of the bunch despite the cost of \$58 (\$US39). It still suffers the same standards-compliance hiccups, but comes with one of the nicest Multiple Document Interfaces around and a tiny application footprint.



But where Opera shines is in UI innovation. The latest incarnation sees a complete rebuild of the client, featuring added functionality such as a fastforward system that grabs the logical links from the source code and works out which will take you to the next page with one mouse click.

Opera also introduced mouse gestures a while back, and these let you perform many simple navigation tasks by using a

combination of left/right-button clicks along with mouse movements, which works incredibly intuitively after some practice.

The Small Screen Rendering feature, which reformats pages into the equivalent of a PDA screen view, is highly useful too for developers. In fact, if

you wanted a combined alternative to Microsoft for email and Web, Opera is worth a

close look thanks to the new M2 mail client integrated into the browser client.

**⊕**Netscape

Google Search I'm Feeling Luck

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- Search Solutions - Services & Tools - Jobs, Press, & Held

Finally, and rather ironically, if you want improved functionality, a vastly more logical user interface and exactly the same reliability and compatibility as Internet Explorer, you might want to look at NetCaptor 7 (www.netcaptor.com).

This uses the same page-rendering engine as Internet Explorer does, but wraps it up in another new UI that brings the most logical and effective of tabbed browsing schemes to the party.

Sure, it isn't a total move from Microsoft software, and it isn't free either at \$43 (\$US29), but it does present you with a workable alternative.

### CONCLUSION

So can you ditch Microsoft? The obvious answer is yes you can, but you might not want to. While there are viable alternatives across the software spectrum, in all but Web browsing and email clients there is no real comparison. The Microsoft offerings remain ahead of the pack in most cases, and only the most anti-establishment (and technically capable) would benefit from ditching Bill Gates completely.

However, Linux and the other open-source movements continue to gather pace and will certainly keep Microsoft on its toes.

# **BROWSERS COMPARED**

WEB BROWSERS	PRICE	AD BLOCKING	TABBED BROWSING	BUILT-IN MAIL	JAVA	FLASH	SSL	LINUX
Internet Explorer 6	Free with Windows	×	×	×	✓	<b>V</b>	✓	×
Netscape 7	Free	<b>-</b>	✓	✓	✓	1	✓	<b>✓</b>
Mozilla 1.3+	Free		✓	✓	1	<b>/</b>	1	<b>/</b>
Opera 7+	Free (ad sponsored); \$58	1	<b>✓</b>	✓	✓	<b>V</b>	✓	<b>/</b>
Mozilla Firebird 0.6	Free	<b>V</b>	<b>✓</b>	×	✓	<b>✓</b>	✓	✓
NetCaptor	\$43	7	✓	×	<b>V</b>	<b>✓</b>	<b>✓</b>	x



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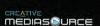
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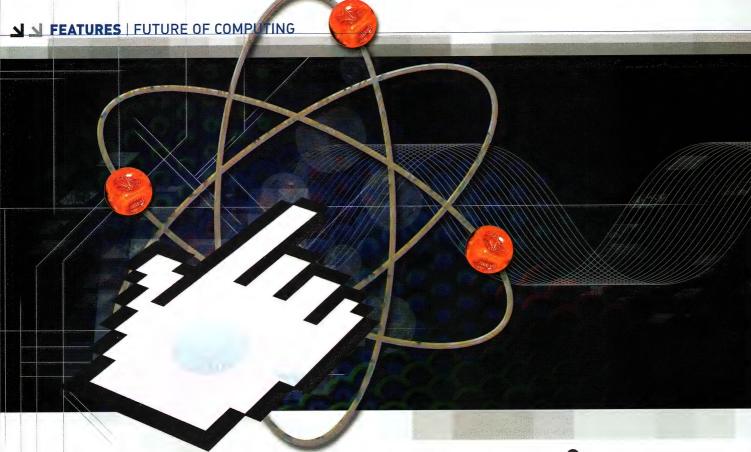




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# Future of computing

The promises of science fiction are closer to reality than you think. Davey Winder boldly goes in search of new frontiers.

he future may not seem all that bright right now, what with global terrorism and superpower aggression dominating the news, but the future will certainly be small. Very small indeed as a matter of technological fact. Gone are the days when Texas Syndrome ruled supreme, 'don't build it big, build it bigger'; now the techno talk in the research labs has shrunk from micro to nano.

When we last looked at the future of personal computing technologies, the old chestnut of the wristwatch computer was aired, and we featured a couple of simple devices that were slated for retail release. They have come and gone, and it's no great shakes to buy a watch with a Palm OS on it for simple PDA work. The concept of wristwatch computing has shifted to a different angle though – that of always–on connections and streams of information.

The Microsoft-backed Smart Personal Objects Technology (SPOT) project is on the verge of releasing the first of its products in the US, in conjunction with various high-profile watch manufacturers. This will be a range of watches that incorporates a true digital screen, with an always-on FM radio signal receiver picking up current information about weather, news or traffic, for example. Later in the year, text message reception might be added, and SPOT is expected to infiltrate markets as diverse as

intelligent key fobs to new concepts in car dashboard design.

But wristwatch computing isn't small enough for the future of technology. You have to drop down to those folk making silicon chips ever smaller (the faster a chip is expected to run, the smaller it must be, thanks to the electrons having less distance to travel – in simplistic terms, admittedly), as well as others who are off doing the same things with power sources using micro fuel cell technology.

Even smaller is the nano technology as seen in projects such as IBM Research Labs' Millipede, which provides a nanomechanical-scale storage device. It will be smaller than a Secure Digital card, but with multigigabyte capacity and at a lower price per MB. But those crafty scientists haven't finished yet. Once they can crack the building of workable nano computers with nano components measured in scales of billionths of metres, this paves the way for the next small thing – quantum computing.

Sure, we know that quantum computing is probably the most over-hyped technology since Pen Windows or Bubble Memory, but it's important, it's innovative, and it will be here in a decade or so. At least, if the experts are

Fossil has already introduced a watch with a Palm OS, but Microsoft's SPOT project will bring always-on information streaming, such as traffic and weather reports.





to be believed.

Quantum computing goes right down to the atomic level and below. Here, in theory, you find subatomic particles that can effectively do two things at once, such as being in both a positive and negative state simultaneously, thus enabling one particle to be both 1 and 0, in computing terms, at the same time.

It gets even stranger once you start investigating it in depth. Take Quantum Mechanical Tunnelling, where we're assured that if something is small enough and travelling fast enough it can pass through a solid barrier without leaving a hole. Take this theoretical proposition and eventually turn it into workable reality and you end up with the prospect of a chip where the electrons within a current can pass right through any insulating barriers in the chips. The mantra now becomes 'don't build it small, build it smaller'. And in so doing, make it faster.

### QUANTUM QUESTION

Michael Freedman is widely recognised as one of the world's brightest thinkers in the field of mathematics, and a winner of the Fields Medal (pretty much the Nobel Prize as far as maths nuts are concerned). He's also working at the Microsoft Research Labs, trying to make quantum computing a reality – no small task, if you'll excuse the pun. Anyone with a passing interest in either the future of computing or the current thinking in the physics field will be aware that as far as quantum mechanics is concerned, it could herald a new age of computing: faster, smaller and more powerful than anything we can imagine today.

This is possible, theoretically speaking, because the laws of quantum mechanics dictate that 'quantum bits' can be both 1s or 0s at the same time, rather than either/or as with the bits in 'classical' computing. A quantum bit (for example, within the spin of a nuclei) is linked to others using a process of entanglement.

Combine these two properties and you end up with the prospect of a computational operation on one quantum bit affecting all the others. The corollary: an awesome amount of computing power that could crack the most complex of encryption codes we use today in a matter of microseconds.

Well that's the theory anyway – nobody has actually proved that the thing can work outside of the realm of academia and corporate research labs. Nonetheless, this is an important technology to keep a close eye on. As some enthusiasts have enthused, it would be the logical end to Moore's Law.

If you look at current technologies used in 'classical' computing, we should reach the quantum level somewhere between 2015 and 2020, with individual transistors reaching the mesoscopic scale of about one nanometre.

At this point, so the argument goes, large-scale quantum fluctuations within the operating remit of transistors and circuits will require quantum-mechanical thinking to be applied to computer design.

Think about the Quantum Corollary to Moore's Law: this asserts that when comparing computing power resources required for quantum as opposed to classical computers, for every doubling period in the classical realm it would require but one quantum bit to be added to the memory of the quantum machine to keep pace.

Indeed, with each bit of information being stored on a separate atom, the possibility of ultimate computing power is achieved in one fell swoop – in theory. Back to reality, and the problems start unfolding quicker than a kid unwraps at Christmas. Take the small matter – no pun intended again – of how to stabilise the spinning of nuclei so as to avoid the scrambling of quantum bit entanglement and therefore losing the information.

Luckily, Freedman specialises in the field of topology, which is

### PLASTIC FANTASTIC

Instead of spending a fortune on building silicon chip fabrication facilities, and we're talking billions of dollars here – IBM established a new chip factory in New York last year and it cost upwards of US\$3 billion – some innovators are looking to cheaper methods of manufacturing electronics. Like plastics, for example.

Not that we can imagine a world where silicon is replaced by plastic, we can certainly envisage one where it's complemented by it. So can companies like UK-based Plastic Logic (www.plasticlogic.com), which is investing in the technology to print electronic circuitry directly onto just about any surface. If we're to believe the hype, then not only will this lead to such things as baked bean tins or newspapers coming replete with printed circuitry, but it will be so cheap to implement as to make these electronic gadgets disposable. In an ironic twist of fate, a can of spam could someday carry electronic advertising. It's the price point that sits at the centre of the debate as to whether polymer-based circuits are feasible, and the price point itself depends upon the printing process becoming a sustainable technological reality.

In partnership with Seiko Epson, Plastic Logic has decided the way forward lies with an adaptation of inkjet printing design.

Printing certainly holds some impressive advantages over traditional etching as used in the silicon chip manufacturing

procedure. For a start, there's scale – polymer circuits can be printed over square metres if required, silicon circuits are restricted to a few square centimetres at most.

Then there's the process itself – no mask alignment at every step, just spray it on as the material rolls through the presses like any other printing process. That includes printing of circuitry on flexible materials, of course. But unlike most other printing processes, especially traditional inkjet printing, precision is key to successful circuit making. The random spread of ink as it splatters onto the paper, albeit minute, is enough to ensure that delicate circuits would fail.

This is where Plastic Logic comes in, with its production of a printing process that can precisely place a single dot to within five micrometres of the target area. That's a tenfold improvement on the performance of the best inkjet printers we use today.

This isn't yet up to the standards of silicon circuitry, but it's getting pretty close. The precision is accomplished by using a patterned surface that has areas to either attract or repel the polymer spray and so effectively drive the droplets into position as they hit the surface. Within a few years, it isn't asking too much of your imagination to expect to see flexible computer screens that could be rolled up and add very little weight to a laptop computer, for example.

perhaps why Microsoft snapped him up. Topology, the abstract maths that concerns shape rather than other qualities such as size, could be key to solving the problem.

Think of how a handful of marbles travels across a tabletop, then record their precise movements over time and, according to the topologist way of thinking, at some point you should be able to trace a pattern of threading that is consistent. Transfer this thought process to quantum computing and the idea is that the computer is constructed of materials known as quasiparticles (as found in superconductors), which have a memory of where they have been.

Thread these quasiparticles together into a plait, using electric fields, and you get something that Freedman believes will represent data but not suffer the same theoretical vulnerability to external disturbance as other quantum-bit constructions.

With the support of Microsoft Research, Freedman's team of researchers, including specialists in materials, hope to be able to develop a real-world material that has all the properties required for quantum computer use. Don't expect a breakthrough anytime soon, though. Even the most enthusiastic of quantum supporters agree that we're a good decade away from any realistic progress.

Not all quantum computer science is theoretical, though. The University of Innsbruck in Austria has built a prototype machine that has a single calcium atom at its core, and claims to have run a program on the thing. The approach of Stephan Guide and his team has been to trap the atom in an oscillating electric field, where it's kept stable and exposed to light from a titanium-sapphire laser source. This causes the ion to release energy in the form of light, which, perversely, cools it down rather than heats it

up. The cooling effect helps to reduce vulnerability to external destabilising properties.

By applying a further series of laser pulses, computation can be achieved with the answer encoded in the electrical state of the ion and read by further exposure that causes it to be released as that cooling light. Okay, so this was merely a proof of principle using something known as the Deutsch Jozsa algorithm, but it's an important step in the right direction.

That algorithm, by the way, checks to see if a coin is fair by verifying that it has a head one side and a tail the other. The quantum approach involves measuring a virtual coin by looking at both sides at the same time. It isn't a new test; indeed, others have already achieved it, but their answers were rather complex affairs involving encoding qubits in large atoms that restricted the chain to ten at most. The new proof of principle involving the titanium-sapphire laser expands the chain to a possible 100 or so, which would mean a more intelligent machine. The power of such a computer increases exponentially with the number of entangled qubits.

Or how about the recent demonstration at Northwestern University in Evanston, Illinois, where scientists were able to move data encrypted by a high-speed quantum cryptology process across a fibre-optic line at 250MB/s. Quantum Noise, or the granularity of light if you prefer, was used to create a signal of far greater complexity than the usual simple 'on/off' pulses to which we're accustomed. The light properties are used to encrypt information into code, and if intercepted it remains secure because it's impossible to determine the on/off status of any bit without the responding reception key.













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Although it's early days yet, this is real-world stuff, and the US military is particularly interested in the development that promises a commercial release sometime in 2006 if all goes to plan.

As with any security and privacy issue, there's always a flip side to the coin. In the

case of cryptology: how easy would it be to crack just about any class of encryption using quantum computer processing speeds? Such is the concern over this matter that the Hewlett-Packard Research Labs in the UK has issued a call for those working in the field to develop secure systems that ensure data is safe from code-breaking attacks from hackers equipped with quantum computers. One of the researchers in question has been quoted as saying that things will be safe for ten years, but in 20 years he isn't so sure.

Another area where the quantum equation can be applied to good effect is that of optical telecommunications networks. Over-investment in laying optical fibre spanning Europe, the US and the major cities of the rest of the planet, was partly to blame for the telco market crash of a few years back. It does mean, though, that the infrastructure is there and waiting to be exploited by a technology that can make use of the spare capacity.

Zia Laser in New Mexico thinks it might have such a scheme, which goes right to the core of the problem; literally, the diode lasers that produce the light which carries the data down the pipes. Zia claims it has found a way to make use of 'quantum dots', which have been much studied, but rarely applied until now.

A 'normal' diode laser is essentially just an 'n and p'-type semiconductor sandwich — one layer with an excess of negatively charged electrons, one layer a shortage so creating pockets of positive charges that remain as the electrons move on. Apply a voltage and the electrons and pockets meet and destroy themselves, leaving an energy trail of light behind. This is the essence of a Light Emitting Diode (LED), and is nothing new. Capture that light to stimulate more destruction, then amplify to result in emitted light being of a single wavelength, and you get a diode laser.

This technique is improved by the introduction of quantum wells into the sandwich, a super-thin superconductor that fits the gap between electron and pocket and traps both within. The resulting quantum well laser runs on less current and is more efficient than a basic diode one.

Throw quantum dots into the mix – minute islands of yet another semiconductor, or dots in a well as Zia refers to it (using the acronym DWELL, which is kind of cute) – and you get a super-efficient laser that consumes very little current. Quantum dots are formed spontaneously when you drop one semiconductor on another with different atomic spacing, and eventually the atoms in both can't take the strain and explode into billions of small islands – the quantum dots in question.

By manipulating the manufacturing process in such a way as to ensure the dots are only able to emit in the particular range of wavelengths that can be sent down an optical fibre, it's possible to create a tuneable laser that can carry up to 80 channels of data at

### **DOMINO FACTOR**

IBM's Research Labs has taken yet another novel approach to the development of computer circuitry. In one of the first demonstrations, all the components required for nanocomputing have been constructed and connected, and then made to actually compute. What they've done is to make molecules fall over, domino style, across an atomic surface to drastically reduce the size of the circuit – some 260,000 times smaller than your average chip at just 17 billionths of a metre. Or put another way, you could fit nearly 200 billion of them on the top of a pencil eraser.

On the downside, the cascades are a one-time-use-only affair, the molecules have to be positioned one at a time, and the whole process takes several hours. However, IBM is already looking at using electrons in similar domino fashion to get around these problems.

different wavelengths. And here's where you hear what may be a familiar acronym – DWDM, or Dense Wave Division Multiplexing – a system put to good use in transatlantic data pipes and which has helped to increase broadband availability in the past few years. Zia has produced a fixed-wavelength laser that uses quantum dots and the heart of a tuneable laser in combination as DWDM links for office networks. These are being tested already and should appear on the market in 2004, improving fibre data utilisation even further.

### **NEXT SMALL THING**

Nanotechnology is as much at the leading edge of computer science research as quantum mechanics; the two disciplines need each other if either is to succeed. Think of nanotechnology as the emerging frontier that will pave the way for quantum computing and you'll have the right idea.

MEMS, or Micro Electro-Mechanical Systems, have been talked up a lot in the past, but research continues to plod on and creep ever closer to a real-world incarnation of the ultimate in miniaturisation. These devices have to be constructed using the same techniques as applied in the field of computer chip manufacture, made of microscopic parts and where machines operate at scales measured in billionths of metres. The IBM Research Labs' Millipede project (www.zurich.ibm.com) is one of the most interesting to emerge so far, concentrating as it does on providing a nano-mechanical storage drive with very real potential.

If you thought the SD cards of today were pretty impressive, wait a couple of years when IBM reckons it will be ready to unleash the Millipede drive on an unsuspecting world. It's the size of a postage stamp, yet capable of storing several gigabytes of data, be that digital imagery, MP3s or any other format that manufacturers feel fit to throw at it. With only a moderate power draw, and running at pretty fast speeds, there's more to the first product of all that research than just a smaller CompactFlash device with a bigger capacity.

The storage methodology is different to anything that has





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  > AGP8X
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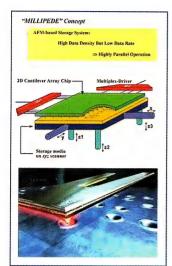
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The IBM Millipede project promises multi-gigabyte storage on a device the size of a postage stamp.

gone before – this is totally new, being based on components borrowed from atomic force microscopy. It uses multiple cantilevered grids to read and write data to a polymer medium, the cantilever heads making depressions into this plastic substance to represent the digital 1 – no dent is a 0.

With an array of 4,096 silicon cantilevers set in rows and linked to microcircuitry to convert the analog pitted information into digital bit streams, and a polymer medium suspended by silicon leaf springs, minute magnets and electromagnetic coils scan across the surface as it's suspended over the lever tips. To get an idea of scale here, these tips can make contact with the plastic by

flexing upwards by a matter of less than a single micron.

It's odd how such a potentially useful technology of the future should hark back to the very beginning of computer data input/output — the punch card, albeit in a ground-breaking fashion. Multi-gigabyte storage, possibly extending into terabit territory, is reduced to a fraction of the size of current memory cards, and because of the manufacturing techniques there's a much lower cost per MB as a bonus. Who said the future was bleak?

#### **POWERING THE FUTURE**

Anyone who has ever used a mobile electronic device, be it a colour-screened mobile phone, a handheld PDA or a notebook PC, will appreciate that the key component upon which everything hangs isn't the complicated circuitry nor the memory chips or anything similar. Nope, it's the battery. Without a mobile power source, your electronics are as useful as a chocolate teapot. Even with the advances in battery technologies, many devices aren't truly 'go anywhere, use anywhere' items unless you carry a spare battery pack, an AC adaptor and, in an ironic mocking of IBM's 'Business Adaptor' advert, a set of adaptors to ensure your power pack works in the countries you visit.

In order to break free of these power source bindings that are literally holding back the development of new and exciting products, a fresh take on the humble battery is required.

This is where New Mexico physicist Bob Hockaday comes in, with his pioneering work in the field of micro fuel cells. While fuel cells aren't a new development as such – the concept is more than 100 years old, after all – Hockaday and his research company Energy Related Devices (www.energyrelatedevices .com) are making important moves in the right direction. Moves that could soon see us using these batteries in our mobile phones and handheld computers. For once, this isn't just a matter of someone puffing up their own PR to raise development funding – the whole micro fuel cells market is about to explode onto the high street, with Samsung

and Toshiba already pushing ahead with their version of the technology. The reason is simple: a micro fuel cell could power your mobile phone for a month or more before needing to be changed.

The micro cells work to the same principle of all fuel cells, mixing hydrogen and oxygen to form water and pulling the resulting energy right out of the reaction. In order to get around the very real problem of scale, as hydrogen is bulky to store and transport, some technologies have taken the methanol route – extracting the hydrogen from the liquid fuel. But even that's messy, necessitating a separate reaction container for the reforming reaction and running rather hot at around 250°C.

The breakthrough has come with the use of a platinum catalyst to do away with the need for the reforming tank, because it can perform its magic at room temperature. Not that we should be jumping for joy just yet, seeing as the company that has developed what they claim to be the most compact DMFCs (Direct

#### TERAHERTZ TRANSISTOR

Some of the technologies that will definitely find their way into the computers of our future have already been demonstrated to work. One such example is the Intel Terahertz Transistor, which was unveiled working under lab conditions in 2001 – elements of this should start trickling into the mainstream market as early as 2006.

This transistor can switch on and off an incredible trillion times every second, and is the first 1THz transistor to be seen working like this. Not that this means a 1,000GHz processor is on the cards any time soon, as there are multiple real-world problems still left to be solved beyond a laboratory proof-of-concept demonstration.

IBM isn't sitting on its laurels either, and is producing some really interesting innovations, such as the 3D chip project. This three-dimensional design uses multiple layers of transistors, instead of the classical single silicon layer, with connectors between them running down through the stacked layers. In effect, this means you can have transistors on top of each other that ordinarily would have been at opposite ends of the chip. This should help boost performance by allowing the integration of processor and memory, for example, and significantly speeding up transmission times between the two.

Another interesting show of technology was provided by the University of Oklahoma, which has found a way to use 19 hydrogen atoms within a single organic molecule to store 1,024 bits of data. They manipulated the protons at the heart of each hydrogen atom at the sub-atomic level, and altered the magnetic moment of each proton as well as the interactions between them to imprint a data signal of zeros and ones. Using a different frequency radio beam, analysed with a nuclear magnetic resonance scanner, the data stream could be recovered.

Okay, it may sound fantastical and complicated, as well as a long way from real-world practicality. However, the technology paves the way for a time when the entire contents of the Encyclopaedia Britannica could be stored on a grain of sand.

Methanol Fuel Cells) revealed the unit in a recent demo to be roughly the size of half a house brick and weighing in at 2kg. It did, however, do its stuff to good effect, producing enough power (40W) on a small 175ml ampoule of methanol to run a notebook, printer and mobile phone simultaneously for eight hours.

Soon they hope to reveal their next-generation device, which promises the same power output from half the size of the original. Despite the size issue, there are other more compelling problems to worry about. Perhaps the most obvious is the availability and distribution of methanol ampoules. You can't just pop into Dixons and buy such a thing, nor can you currently carry ampoules of pure methanol (a highly corrosive chemical requiring strict packaging criteria to be met) into the cabin of an aeroplane.

As the technology matures, both issues should be addressed. But even then, there are more technological hurdles to get over, and the one causing most concern is the ratio of power density to the canister mass/volume. Getting a fuel cell of similar size to, say, a lithium ion battery cell to actually produce an equivalent amount of power is something many commentators seriously doubt is possible in the short term.

Hockaday is more optimistic though, having already produced a prototype micro fuel cell the size of a credit card by using an ampoule design that lets the methanol diffuse into the cell through

the porous surface – the resulting water is drained using basic capillary action.

This is being developed as a mobile phone charger that can be clipped to your belt and trickle-charge your phone on the move. The prototype has performed well, powering a mobile for more than six months without turning it off.

Yet some have managed to get even smaller with their fuel cell developments. Scientists at Case Western Reserve University in Ohio have produced a working prototype that's just one centimetre square and no more than a few millimetres thick. Their plan is to develop a technology that allows the fuel cell to be created at the same time as the electronic circuit is being printed, incorporating the power supply directly into the chip. The prototype apparently managed to run for ten hours on a fuel tank of hydrogen the same size as the fuel cell.

#### **REASONS TO BE HOPEFUL**

Many of these future technologies may sound so unrealistic as to be ridiculous, but before you get too cynical take a look at how far we've come in the last 20 years. It was only in 1981 that IBM released the first mainstream desktop with its stunning 4.77MHz 8088 CPU. Now, we're blasé at the thought of 3.2GHz chips, while 400MHz processors power pocket computers.

With research institutions and the efforts of IBM, Intel and Hewlett-Packard driving innovation forward, nothing is impossible, and we should have some interesting times ahead.

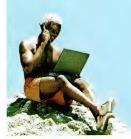


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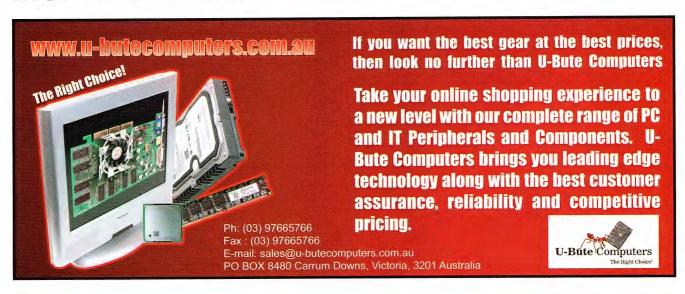


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# CONTENTS REAL WORLD COMPUTING, MIND YOUR BUSINESS & TECH SUPPORT





# PLUS DME

# **Jon Honeyball** is overwhelmed by Microsoft's latest and greatest – Windows XP Plus!

can't contain my excitement - Microsoft has launched the most important product of the year and it's just turned up at my office on a single CD accompanied by some documentation. Forget Server 2003, Office 2003 and anything else with 2003 in its title. This baby is gonna do the business and will ensure the sort of solid revenue stream and user excitement that every ambitious product manager dreams of at night.

I am, of course, referring to the Windows XP Plus! Digital Media Edition (DME) add-on. This is a new Plus Pack that's aimed at 'emerging digital lifestyles' among other such egregious

marketing concoctions. I can feel you disgustedly backing away from these words and getting ready to turn the page, but please indulge me for at least a few more traitorous sentences.

This pack epitomises the modern compelling tool suite, and there's no way I can avoid starting off with its crème de la crème, a treat that alone is reason enough for anyone who doesn't yet have a computer to buy one just to run it.

This comes in the lovely form of the Plus! Dancer application. This breakthrough piece of coding places one of 11 dancing people on your Desktop: their moves are incredible, fluid and quite hypnotic. Naturally, each one possesses not only a name but a potted biography.

For example, Amanda specialises in House music and apparently 'this 19-year-old, full-time college student is also a dancer, coach, choreographer, instructor, business owner and part-time travel consultant. She has been dancing professionally for 14 years, with formal training in ballet, tap, jazz, lyrical, modern, step, cheer and hip-hop. Amanda, who started teaching dance at age 14, is currently a co-owner and artistic director of a dance studio. She is also a dance



Plus! Photo Story enables you to turn your holiday snaps into Weapons of Mass Distraction.

choreographer for several award-winning cheerleading teams. Amanda was a member of the dance group for a professional basketball team during the 2001-2002 season.' Need I say more?

Then there's Cobey who specialises in hip-hop, Seth who does B-Boy, and Kenny who loves disco. Chanel is into funk and Ben does The Sprinkler (sounds vaguely rude). Not content with just one dancer? Then why not push the outer envelope of your graphics card performance by having two dancing together? Nikole and Marcelo do Salsa, Evan and Michele like to Tango, and Jen and Dave are masterful at Swing. My mind is just buzzing with the possibilities here, and I feel strangely compelled to go on and tell you more. Apparently, the dancing is supposed to be synchronised to the music, though I'll confess it looked a bit random to me. I guess playing a CD of the music of Tibet, especially the deeply rocking number called 'Singing Bowls of Tibet', might not have helped much. Ah well.

But let's move on. The Plus! Photo Story application allows you to take a pile of images and record a voice track over the top. You can even drop in a music background and have the images move slowly around on screen in a desperate attempt to make them more interesting.

Naturally, there's a full set of tools to prioritise the various wipes and moves, and once you've created your masterpiece you can output it in Windows Media format for all the family to enjoy.

Never before has the humble holiday snap been treated to such a makeover.

As you're no doubt already a big fan of Windows Media Player, the Plus! Party Mode add-on will be a godsend. This allows you to re-skin the Media Player so that it can run full screen.

You can also lock down the application so that your friends can select the party music on-screen without

getting access to your Desktop – just what the world really needs right now.

The Plus! Analog Recorder lets you stream audio in from your grandfather's gramophone via your computer's sound card in order to convert all those old-fashioned vinyl LPs and singles into modern Windows Media files. It can even de-scratch and de-hiss these recordings, removing the pops and clicks that such antique technologies accumulate.

The Plus! Audio Converter lets you convert the formats of your media files. You can't, however, go straight to MP3 without obtaining a third-party encoder, but Microsoft had to leave a bit of room for its community of third-party developers somewhere.

You can print labels for your CDs using Plus! Label Maker, wake up to music with Plus! Alarm Clock, fall asleep to music with Plus! Sleep Timer, and spend countless hours fiddling with eight new skins for the Media Player itself.

Considering by now you'll have become bored with still pictures, despite the stunning new capabilities of Plus! Photo Story, you'll be gagging for the new transitions and effects that plug into Windows Movie Maker 2. And finally,





Cobey specialises in hip-hop, Seth does B-Boy and Kenny loves disco. So now you know.

you can enjoy this multimedia bonanza from your Pocket PC PDA by using the Plus! Sync & Go tool.

This Plus! DME experience is so overwhelming that I'm now lost for words. Dammit, my sarcasm gland is beginning to hurt, so the truth must be told. Well, I can't deny that Plus! DME is hardly expensive at \$43, but quite frankly it should have been a free download (Redmond ought to take more notice of the 'digital lifestyle hub' work that Apple is currently doing).

Microsoft should feel deeply ashamed for charging its users – the XP Home brigade one presumes – any money to install this collection of polished but ultimately vacuous distractions. A few parts of the kit are going to be useful and worth having, while others like the dancers are utterly cringeworthy. Is this the best Microsoft can do?

#### MS buys VMS

Well, actually, no it isn't. Thankfully, Microsoft does still notice some important trends and needs of real users, and comes up with some truly trend-setting technologies. One that has piqued my interest is its recent acquisition of the Virtual PC technology from Connectix. I've been using Connectix's VPC emulation of the Intel processor for some time on my Apple PowerBook, which lets me open a window and boot any Intel OS that I want right there on my Desktop. Care to fiddle with Windows XP Home? No problem. Windows Server 2003 as well? Why not. The only limitation is the amount of RAM your real computer contains, because booting full-blown OSes like XP isn't something you can squeeze into a couple of megabytes.

It's worth remembering that Virtual PC runs on other platforms too, including Intel itself, so you can run different OSes in virtual machines on your Desktop without the tedious task of shutting down and rebooting.

This is a mature technology too. On my Mac OS X installation of VPC, I can

control things like the virtualised networking settings, the way it interacts with hardware like USB ports, and how it maps through into the hard disk space both locally and remotely. And now Microsoft has bought it all.

The obvious question is 'why on Earth would Microsoft want to own a technology that allows you to run virtualised PC systems' when it has always had OSes that just booted on the hardware anyway? Well, it's becoming clear that Microsoft has two main intentions with this purchase, and both of them are quite fascinating.

Let's start with the forthcoming Virtual Server product that Connectix has been hinting at and which is in late beta at the moment. This allows you to boot a server OS into a virtual machine running as a task on your existing OS. Microsoft has a real need for this product as there are still a lot of servers out there running NT 4, and the hardware and driver support for NT 4 is now almost frighteningly out of date with the reality of the hardware shipping today. Don't forget that NT 4 first shipped in 1996 and here we are seven years later.

Back then, a 486 was considered amazing and a few of us were pushing the limits with motherboards running twin Pentium processors at 90MHz. Today, we're about to move out of the multigigahertz Xeon world into a new 64-bit arena. Large IDE format was a dream back then, while technologies like fibre channel and Gigabit Ethernet were future fantasies.

Given that some of these NT 4 systems are still running happily, Microsoft needs something that permits snapshots of NT 4 and then run on more modern hardware. It isn't just that the old server was slow, but there's a real problem with driver support and hardware reliability. What are you going to do when something breaks on that old 486-powered server? It's not a nice thought.

There's another reason too for Microsoft to want this Virtual Server technology. Given that modern servers can have an almost unlimited amount of power in them, there's a lot to be said for running server services within a virtualised OS that's run over a real base OS. Yes, the base OS will have to simulate the processor that's used in the virtual process, but it can do that very quickly. Being able to move virtual servers around on top of a hardware farm is the ultimate in flexibility. And with the move to standardised and sensible interconnection

between server services – thanks to the emergence of SOAP and XML protocols – doesn't it make good sense to virtualise each server service into its own hermetically sealed virtual machine?

The second of Microsoft's intentions is equally fascinating. If you're developing an application on your desktop machine – which is probably running Windows 2000 Professional or XP Pro – you might need access to Server running Exchange 2003 or some strange configuration of Internet Information Server mated with Oracle and a big SAP installation. Rather than going out and hitting the hardware itself, why not debug against a virtual machine running within your own machine? This is especially powerful if you want to debug between multiple versions, or even between different OSes.

Microsoft has already demonstrated debugging a Pocket PC application running on Intel's ARM processor on the same machine as the Visual Studio development system itself. It just boots Virtual PC with the right sort of processor architecture in place, then boots a real, standard copy of Pocket PC and squirts in your application for running, debugging and whatever else you might want to do.

The same applies to a smartphone – boot it and work with the same code base and installation as if you were dealing with a real, physical smartphone, only this one exists on screen.

I think this way of working is going to have a major impact over the next few years, especially once you realise that the core Windows Win32 API is being pushed into the background for the forthcoming Longhorn release of the Windows desktop OS (which is very likely to be called Windows 2005).

The main run-time and interfaces will all be managed code generated from the Visual Studio .NET development system.

Obviously, not everything is going to be converted to managed code in the next 12 to 18 months, but C++ is deliberately being pushed into the background by Microsoft, and this will be true of all desktop and server apps. Core OS components, especially device drivers, might well need to remain written in C++ or handwritten machine code for some time to come, but the move to managed code promises to deliver a more stable future where applications are deliberately kept separated by the common run-time engine, so they play nice with the OS and other programs.

#### Office 2003 bundling

One thing has just struck me about the Office 2003 launch. Microsoft has changed its branding style so that everything is now 'Microsoft Office' and then the individual product name. So Word is 'Microsoft Office Word 2003' and Excel is 'Microsoft Office Excel 2003'. Now go and take a look at the Start/All Programs menu. Notice how all the Office XP or Office 2000 applications entries have disappeared? See how there's now a Microsoft Office menu folder and this contains all the application shortcuts? I'm still trying to work out why this has happened. It certainly hasn't happened on a whim, and so there must be some logical reason behind it. Microsoft is obviously trying hard to emphasise the Office suite as an entity and to downplay the role each individual application plays in that space.

I think this is more than some marketing fiddle, but rather the first steps toward a new application framework for Office. The mindset behind it works like this – as each Office application is, to a greater or lesser extent, pushing hard towards an XML future, each application as presented today is subsumed into the role of a focused toolkit within a framework environment.

Think of the way that Visual Studio .NET works today to get an idea of where I'm coming from with this. You bolt complete compilers, debugging tools and all sorts of other things straight into the VS .NET framework, and the framework provides all the supporting infrastructure required. I think this is the mindset that's going to be applied to Office.

This certainly isn't there today in Office XP and won't be fully there in Office 2003 either. However, I can foresee an Office 12 or 'Office 2005' for the Longhorn release of Windows where you actually start 'Office' as if it was a tool, then within this Office XML framework you work using whatever tools you want and have bought a licence for. It would certainly help to add much needed fluidity into the licensing process for Office. Currently, there are almost countless packages, and some of the bundling decisions seem a little odd to say the least.

To back up my hunch, it's interesting to note that the forthcoming InfoPath XML application won't be part of any of the Office 2003 suites. This announcement, made only this week, is quite fascinating. Yes, it makes sense that only far-thinking users and developers will need the capabilities of InfoPath, at least for the

time being. However, it also sets up an interesting expectation, which goes something like this: because Microsoft isn't putting InfoPath into any Office bundles, it doesn't need to worry about taking it out again in the future.

That's because I think InfoPath is a 'one-version product' whose core functionality will in fact become the 'universal canvas' of the future Office framework product suite, and as such there will no longer be a need or place for InfoPath as a product per se. It will become part of the aether of the entire Office framework.

the Itanium family or CPUs from Intel, which is almost turning into a long-running parody.

And a key technology here for Microsoft is the Common Runtime Language of Visual Studio .NET. Remember that your programming language, whether it be Visual Basic, or C# or C++ or Cobol or Fortran or some weird academic language, all compiles to IL Intermediate Language.

The IL code is then compiled by the target CRL runtime on each platform. The IL code really knows nothing about the underlying hardware, or even if there's

# 'I have absolute (if naive) faith that it will keep working until the moon crashes into the ocean.'

Only time will tell if this hunch is right or wrong, but it's interesting to see how InfoPath, arguably the most important new component in the Office 2003 suite, is actually not going to be in any of the suite bundles. You read it here first and, as always, comments are welcome to the usual address.

#### 64-bit Windows

The announcement that Microsoft is going to release a 64-bit version of Windows for the AMD Opteron 64-bit processor is welcome news indeed. I've seen it running on prototype AMD hardware, and it works very well. Indeed, it could be argued that Microsoft has decided it no longer needs the weight of a company like Intel backing it, and it can make its own decisions about the platforms it will support.

I accept that in the past NT was available on a range of hardware platforms. Indeed, one of my oldest and most trusted servers is still an NT 4 box running on the Digital Alpha reference motherboard. It keeps working, year-in year-out, and frankly I can't be bothered to move the services off it onto another box, because I have absolute (if naive) faith that it will keep working until the moon crashes into the ocean.

But back then it was clear that the hardware was either vastly too expensive, or just not available. Did anyone ever manage to see a PowerPC-based NT box actually for sale, for example?

With AMD 64-bit, it's different. AMD has a compelling platform and Microsoft has decided to support it. Certainly it seems to be a more rational solution than

Windows there at all. So once we see applications coming to market that are written in IL, then the porting issue to new chips like AMD and Itanium, plus anything else Microsoft cares to support, will be much easier.

When Microsoft said it was betting the farm on the Visual Studio work, it wasn't joking. It's the means by which the company can decide what platforms it works on.

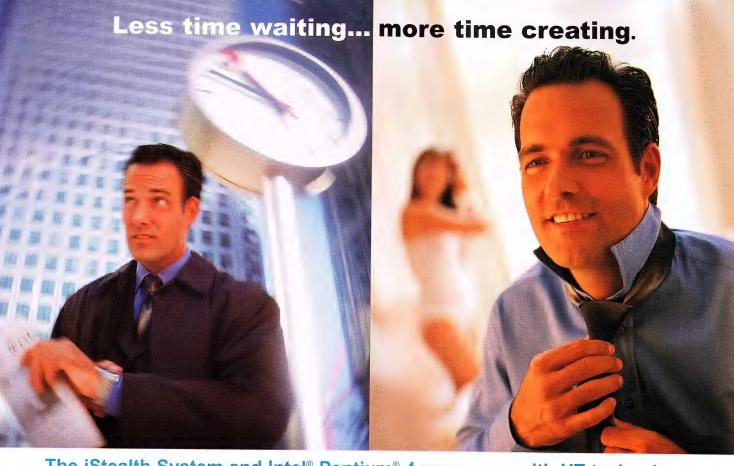
The previous methodology of recompiling source code for each platform didn't work. Few applications were ported to Alpha, let alone to MIPS or PowerPC versions of Windows NT. And those that were ported often had any number of exciting bugs, especially in the slightly more esoteric hardware device driver area. Anyone remember the pain of hardware SCSI controllers on Alpha?

I rest my case.

Although CRL and IL don't change the problems of underlying driver support, it will make application porting to be a much more seamless thing, especially with the virtual machine offerings Microsoft now has up its sleeve. And in the 64-bit arena, I can only say that we live in interesting times.

#### JON HONEYBALL

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# SHAREPOINT SERVICES

Simon Jones guides you through Microsoft's refined groupworking tools.

or companies that require teams of workers to collaborate when producing documents, the big news in Office 2003 will be SharePoint.Virtually all the Office applications will make use of SharePoint in one way or another, and Microsoft's marketing department has begun skillfully intertwining Office and SharePoint in its sales pitches so you hardly know where one starts and the other stops. So, what exactly is SharePoint and why would you want to use it?

What Microsoft now refers to as 'SharePoint Products and Technologies' grew out of the Digital Dashboard technology that Microsoft started work on roughly four years ago. Digital Dashboards were Web pages constructed from a collection of smaller Web

Parts. Each Web Part showed it's own single nugget of information: a list of customers; a weather map; a graph of sales figures. Administrators could set up these Web Parts and pages, and users could easily say which parts to show where on their own pages.

This was then extended to become a Team Website, where users could store documents for collaboration within their team, and provided a home page showing useful information that each user could easily customise.

This concept, minus much of the customisation code, was given the name SharePoint Team Services and soon became part of the Office suite. If you have bought Office Developer Edition or just FrontPage, it is possible to design, install and run a SharePoint Team Services Website for your office.

SharePoint Portal Server was a much bigger product, which allowed full customisation of Web Part pages along with added document check-in/check-out facilities and content indexing. This was a



SharePoint intranets are highly customisable.

separate, paid-for product and Microsoft claims it has sold 20 million licences for it to date. Large corporations obviously must like the product.

With the release of Office 2003, Microsoft has totally revamped the SharePoint range of products. SharePoint Team Services is dead and will no longer be supplied with Office. In its place, welcome SharePoint Services, an add-on for Windows Server 2003. SharePoint Services may inherit the SharePoint concept and the name but it has been totally rewritten in ASP .NET.

It uses SQL Server to store all its data, while communication between Web Parts, SQL Server and Office is all done using XML. If you don't have SQL Server, SharePoint Services will install MSDE (Microsoft SQL Server Desktop Engine) and use that instead.

SharePoint Services wasn't ready in time for the launch of Windows Server 2003 in April, but it should ship at the same time as Office 2003. SharePoint Services includes the Web Part engine, checkin/check-out and content indexing. You can create multiple SharePoint Websites in your organisation, but they'll remain separate entities.

The new SharePoint Portal Server adds a layer above these sites to integrate them into a single, cohesive site for your organisation.

It also brings more personalisation in the form of your own Web pages, which for you act as your portal onto the world and, for others, as information about you, the projects you work on and your areas of expertise or interest.

Microsoft now refers to SharePoint Services and SharePoint Portal Server collectively as SharePoint Products and Technologies.

#### Collaborative features

The main use of SharePoint will be to facilitate collaboration among team members. These may be permanent teams or ad-hoc teams set up for a particular project - SharePoint doesn't mind if the team lasts a day, a year or five years.

A team could be a set of people from many departments within an organisation who need to collaborate on a document, a meeting or a project. You can even set up social team sites for extra-curricular activities such as the company darts team, squash ladder or brass band.

Each SharePoint site has a front page based on Web Parts. To this page you may add lists, discussions, surveys, documents and picture libraries. You can even customise the look of a SharePoint site by applying a colour theme or editing the pages individually in FrontPage.

#### Lists

Lists contain common information that you might want your team to know. There are predefined lists for announcements, events, contacts, tasks or links, and it's also possible to create your own lists, defining



Meeting
Workspaces are
useful and easy
to set up.

defining what data should be stored and how it should be displayed.

Each list you create gets a simple form through which to enter the data, and you may create different views of that data, sorting, grouping and filtering the

data as you want it. You can create fields for text (single lines, multiple lines or rich text), numbers, dates and so on. It's also possible to attach files to items in the list or associate items with other items in the same list – you can even have fields that look up values in other lists. Lists may be linked to Excel workbooks or Access databases, and such links remain alive and work in both directions.

Any view of any list can appear in a Web Part on the front page, which is great for showing summary information such as new announcements, upcoming events, which staff are currently online and useful links. Any list you customise or create may be saved – complete with the definitions of all the fields and views – as a template, allowing you to create clones of successful lists. It's possible to share these templates with other teams throughout your organisation to encourage consistent communication styles.

#### **Discussions**

Sometimes you need to have a discussion between several people, but they can't all meet at the same place or at the same time. You could use email, but it's difficult to ensure that everyone sees all the comments or for new people to join in partway through a discussion.

SharePoint allows you to easily set up discussions where anyone is able to ask a question or post a comment and other users can reply. All the comments are kept so that latecomers may catch up, and the comments are displayed in threaded order so you're able to tell which comment goes with which original message.

In effect, discussions provide you with a private conferencing system like a miniature version of the *PC Authority's* Web forum section.

#### Surveys

If you want to find out what your team thinks about one of your projects, an idea, or just anything in general, it's possible to quickly set up a survey to ask them. Each person can answer the survey, but only once, and you may tabulate or graph the results at any time. The results of complex surveys can, of course, be analysed in Excel, remember a survey is just a special type of list.

#### **Document libraries**

If several people are co-operating on creating a document, you might store the document on a file server. However, if two people try to edit the same document at the same time, one person risks overwriting the other's changes.

Microsoft Office applications try to minimise this risk by restricting documents that are being edited to be read-only for the second and each subsequent person that open them.

You could use the 'send for review' process in Office to email a document to many people to get their changes and then merge all these changes back into the original document.

SharePoint lets you set up shared document libraries where users can save documents needed by the team. You can either save a document to a folder on your hard disk or a local network folder and then upload it to SharePoint, or you may save directly from Office applications to a SharePoint document library. The File Open and File Save As dialogs will show a SharePoint Website and allow you to navigate to the correct library.

Documents kept in SharePoint may be checked out to someone so that they — and only they — are able to make changes to it. Once they have finished with the document, they can check the document back in so others are able to see the changes and check the document out to make their own changes.

#### Picture libraries

SharePoint Allows you to create a special class of document library for storing pictures, which shows thumbnail images of the pictures rather than just a list of filenames. You can give each picture a title, description and some searchable keywords, and record the date it was taken. This will then allow other users to sort and filter the pictures. You could use a picture library, for example, to hold publicity shots for your company or to share pictures of a social event.

#### Document Workspace and live attachments

Documents in a document library can be promoted to separate Document Workspaces, which have their own access lists, document libraries and lists of tasks for the members to carry out.

It's possible to create such a Document Workspace by emailing a document to one or more people – Outlook's Attachment Options Task Pane allows you to send the document as a regular or live attachment, and the latter choice will create a Document Workspace.

If you choose to create a Document Workspace, then whenever a recipient goes to open the attachment Office will check the Workspace and give them the latest version from there rather than the original copy that was emailed to them. Thus, everyone always sees the most upto-date version of the document with everyone's changes rather than just the original version.

This means people don't waste their time duplicating comments or changes and they can react to other people's ideas in a timely fashion. This facility should, if used intelligently, greatly reduce the time it takes a group of people to create or revise a document.

#### Meeting Workspace

An interesting variation on the Document Workspace is a Meeting Workspace. You can either create these from scratch in SharePoint or when you set an appointment in Outlook.

A Meeting Workspace may contain an agenda, a set of objectives or decisions to be taken, a document library of documentation to be read before the meeting, a set of tasks to be allocated, a list of things to bring to the meeting and a list of the attendees.

All the attendees receive an email containing a link to the Meeting Workspace so they can read the agenda beforehand and the minutes or outcome of the meeting.

#### Alerts

Any user can ask SharePoint to send them an email if someone adds, edits or deletes a specific item or any item from a list or library. These emails may be generated at the time of the change, once a day or once a week. The emails contain links to the item that was added or changed, to the item's list or library and to the SharePoint site. This makes it easy to see what other people are doing on the SharePoint site.

#### SharePoint Portal Server

All the abilities I've discussed so far are possible using just SharePoint Services, which comes free with Windows Server 2003. What extra then does SharePoint Portal Server give you?

Well, as things stand, your departmental SharePoint Websites remain separate entities: if the finance department has a SharePoint site and sales has one too, you won't be able to easily navigate from one to the other or do cross-site searches.

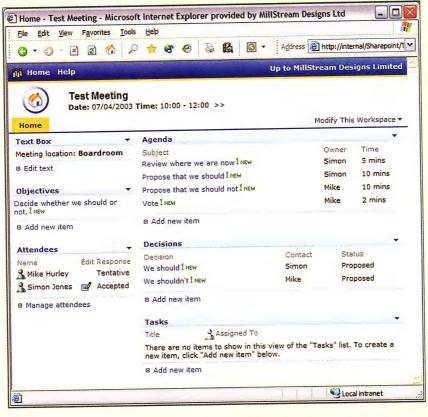
SharePoint Portal Server manages site aggregation, so your departmental or team sites can be classified, browsed and searched from a single company-wide intranet home page.

IT departments may lock down specific Web Parts or page zones so that, for instance, users can't hide or remove a vital company announcement Web Part from their view of a page.

SharePoint Portal Server also introduces personal Web pages that users can customise, both to show themselves the information sources they need to do their job and to show others information about themselves and their activities. Links, announcements and other information may be targeted to individuals or groups by their job roles, security groups or any other criterion you can think of. If you have legacy databases or corporate business applications such as SAP that require separate logon credentials to retrieve personal data, SharePoint Portal Server and BizTalk Server can marshal lists of usernames and passwords to automate these credentials and retrieve your data from such systems without having to ask you to sign in again.

#### Office Web Parts

As well as the standard Web Parts for showing lists, appointments, users and so on, there'll also be some parts that are more closely tied to Office applications.



You can drag Web Parts from the tool pane onto a page.

For example, Microsoft is planning Web Parts to show spreadsheets, PivotTables and PivotCharts. The spreadsheet Web Part can be used to show data from Excel workbooks or other data sources in a familiar format but live on a SharePoint page. PivotTable and PivotChart Web Parts will show summary data from SQL Server or the spreadsheet Web Part in such a way that they can be analysed easily to spot trends or exceptions.

Another Web Part under development is called the Web Clipper, which shows a small section of some other Web page on your SharePoint Website. You can select individual tables or images from any page and the Web Clipper Web Part will show just that data, refreshing it from the source page whenever necessary.

Microsoft is also working on other Web Parts that SharePoint administrators will be able to download from an online library, but these aren't finished yet. They will undoubtedly include NYSE stock price finders, weather forecasts (for US cities) and similar information feeds, but we might get lucky and find that some of them are useful outside of the continental US or the financial communities.

In addition, as the Web Parts used by

SharePoint Services and SharePoint Portal Server are just special types of ASP .NET controls, Microsoft will shortly make available a Web Part Library template for Visual Studio .NET, which will allow developers to create their own Web Parts. I haven't had a chance to try this out for myself yet, but the presentations and walkthroughs I've seen so far make it look reasonably easy.

#### In conclusion

I've had three weeks now of building SharePoint sites using SharePoint Services Beta 2 and I'm impressed by the stability, ease of use and the sheer usefulness of the whole thing.

I'll be investigating SharePoint Portal Server in the next few

weeks when I have a spare machine to install it on, and I'll be interested to try my hand at developing Web Parts when Microsoft releases the templates for Visual Studio .NET.

Should you also be looking at SharePoint as well? Well, I'm certainly going to be recommending that many of my clients now look at SharePoint Services. It is valuable as a cost-effective way to implement business communication systems – it gives you an awful lot of bang for just the price of upgrading your current server to Windows Server 2003.

And remember – if you bought Software Assurance on Windows Server 2000, you've already paid for the upgrade in any case.

#### SIMON JONES

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# YOU BRING SPECS, I'LL BRING SOURCE

Mike MacCana reveals how to turn source code into ready to run packages.

s the Beastie Boys famously said (or thereabouts)... Ad Rock, Mike D, and MCA were of course talking about the process of building packages from source code on Linux systems. And just like the rap trio, as you'll no doubt be aware, many Linux applications have source code that's publicly available to download. This is great for software developers, and the basis behind the success of the OS, but what can source code do for the rest of us? You can find ready-to-run binary packages for most applications which will install in a snap, and tools like up2date, yum, and apt ease the process of fetching any other software that's needed to run them. Comparatively, building from source is difficult, and many new Linux users prefer to get by without compiling anything themselves. Yet old timers often prefer compiling all their applications, and some - including myself sit on the fence, installing pre-built packages when they can or compiling my own software into packages when it's appropriate. So, when is it appropriate to build from source?

• If your application is very new or still in beta, nobody may have got round to building a binary package yet. If you want

#### **MAKING IT SIMPLE**

The 'configure; make; make install' process is part of something called GNU Autoconf, designed to make configuring options for building software easier and more standardised. The overwhelming majority of Linux software for which source code is available uses this system. In fact, you can basically assume it - unless you get a rare './configure not found' or similar when building an application from source code. The important thing then is replacing %configure with a series of commands to install the application in the build root you've specified. So for an ordinary app, you'd tell the app you're building to put binaries in %BUILDROOT/usr/bin, libraries in %BUILDROOT/usr/lib, %BUILDROOT/usr/share/doc/nameversion, etc - see your app's documentation on how to do this.

to install the application, you should grab an archive containing source code and make one yourself.

• Some applications can be customized at boot time by building in more or less features, or optimising the app to run on a particular system. Last month I mentioned Samba 3's support for newer Windows server functions such as dfs (which allows clients to map to shares using the same name while the share moves from one server to another). Samba's dfs support is enabled or disabled prior to it being

built. It's a useful feature to have if you're going to use it, but it's still being tested, so many binary packages don't include it. Building from source will allow you to add or remove this feature as you prefer.

#### Suspicious packages

To turn source code into binary RPM packages, you will need to do a couple of things: download the source code, and create a spec file.

The spec file describes our application and contains information like the application's name, version, copyright, and instructions on how the application is built. There's sample spec files available for all the packages for most Linux distributions (just install the source packages from the CDs, and then take a look in /usr/src/(distro) /SPECS), as well as sample spec files available from sites like the Fedora project (www.fedora.us) or FreshRPMS (http://freshrpms.net). Go and take a look at one now.

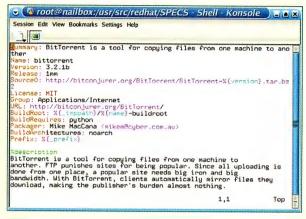
The basic options in the spec file are written in Option: Value format (such as Name: Samba). There are also a number of distinct multi-line config sections which have the following specific titles.

#### · %description

A multiple line description of the software.

#### %prep

Things you need to do to prepare for



A spec file for the Bittorrent peer to peer app as viewed in Vim. The syntax highlighting helps understand exactly what's going on.

building the software. This file generally consists of two commands – one which removes any old files from the temporary directories used by the rest of the process, and a special RPM macro called %setup. Macros are inbuilt functions in RPM that can be run to avoid having to type multiple commands – in this case %setup runs commands to extract the archive into a temporary directory (such as /usr/src/(distro)/BUILD) using whatever appropriate archiving tool, and then changes into that directory.

#### • %build

This runs a macro called %configure, which in turn runs a program called 'configure' (contained within most Linux apps) that configures how the app will be built. This includes parts of the program to build or exclude, the locations where different types of files will be installed, the processor (Pentium 4, Athlon, etc) to build for, and more. The %configure macro used by the spec file provides some parameters to make the application install inside a 'build root' – another temporary directory.

Another command included with the app called 'make' is run, which compiles the source code.

#### • %install

The make script is run again, this time by a macro (%makeinstall) that provides a bunch of additional command line options, the most important one of which is the

install parameter. This installs the compiled files to the directories specified earlier (ie. beneath the build root).

#### • %files

This section defines the files that will be included in the package relative to the build root. The packaging system will archive these files along with the information in the spec file to create an RPM file. Of course, if you're building the software for the first time, you might not be sure of the files that'll be installed. Just put a '/' in this section and you'll get all the files installed (you can fix this later).

#### Getting to work

So let's get to work. I'll be packaging a little app called QTParted, a graphical partition editor for Linux. Since QTParted is pretty new, nobody has ready-to-install packages available yet. So let's be the first. We've downloaded some tar.gz archives of the

#### SPECS IS NATURAL, SPECS IS FUN

Here I've shown how to turn source code into packages. It's possible, and quite common, to simply not bother creating packages of source code apps. So why do it?

By building packages you'll ensure that you application installs, uninstalls, upgrades and can be queried or verified in the same way as any other app on your system. It means you can take your custom package to another system and reinstall it without having to rebuild it. You can detect changes to the files from what you've installed using RPM's file verification mode, and the options that RPM provides to configure ensure the files in your application install in standard locations. All of this not only saves you time, but also makes your machine much easier for the next fellow who doesn't have to deal with a bunch of orphaned files all over your hard disk

So why ever install an application without packaging? We suspect it's because a lot of people who distribute software just don't know how easy packaging can be.

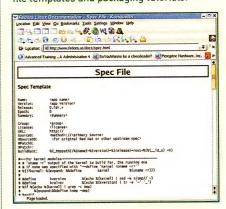
Here we're making RPM format packages of our application. RPM is the standard package file format on Linux and RPM packages can install on all Linux standard base distros.

source code from the Website, and saved these files to /usr/src/(distro)/SOURCES.

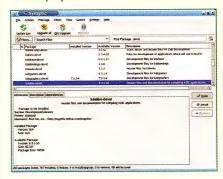
- Install the latest packages for rpm-build, glibc-devel, and gcc via up2date, yum or apt (these packages are used for building and packaging almost any app).
- Download a .spec file template from www.fedora.us or http://freshrpms.net.
- RPM Packages include a 'Release' option. This allows the packaging system to keep track of newer packages of the same software. Put a number (start with 1) followed by your initials. Then, if you change your spec file, increment the number by one.
- · Add any special options you'd like to add to the configure command after %configure, and likewise for make. The only difference between 'configure' and the '%configure' macro is that '%configure' expands to tell the package to install into the build root.
- Rebuild the spec and watch the output: rpmbuild -bb qtparted.spec
- · What's that? Got any errors? Some .h file missing? Maybe a message about not having KDE installed, when you're clearly looking at it on screen? You're missing a devel package. These packages contain header files, used to create software that's built against an application. Almost all programs on a Linux system come in at least two packages - a normally named package which provides the actually application, and a -devel package which provides header files necessary to compile software that works with that app. If you want to use the app you'll need the former, but that latter is only for compiling stuff that uses that app. Most of the time the name of the -devel package will be obvious (rdesktop-devel, kdebase-devel, etc), but if you're not sure you can use up2date -whatprovides=<file>, apt-cache search <file>, or yum to find out the name of the package which contains a given .h file. Install the package, add it to the BuildRequires: section of your .spec file, and rebuild the spec again.
- · List all the files in the package. Paste this into the spec file right after the %files heading. Now remove entries for directories you can expect to be there on pretty much any system - /usr/bin, /usr/share/doc, etc. This tells the system that these files aren't part of the package, so the package shouldn't try and remove them when uninstalling (don't worry, if you ignore this step completely then you'll merely get a message saying that the directory wasn't empty when uninstalling).



As well as lots of software packages for Red Hat, FreshRPMs provides useful spec file templates and packaging tutorials.



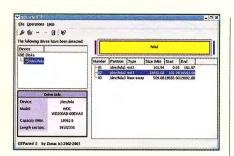
**A** sample specfile courtesy of the Fedora project.



Devel packages provide header files used to compile software. If building an application from source code fails, 90% of the time it'll be because one of these is missing.

· Once you're done, you'll have a .rpm file to install - in our case, brand new packages of the latest QTParted release. It may be worth contacting the project, and / or sites like FreshRPMs or Fedora) to host your file.

Correctly compiling a custom kernel Speaking of turning source code into packages, you can easily create your own



Smaller apps and beta software don't always have packages available – but you can make them yourself with a little knowledge.



You can easily make the kernel source into your own custom Linux kernel packages.

custom kernel packages too. Good reasons for compiling a custom kernel:

- You'd like to experiment with experimental options or patches.
- You'd like to create a new kernel package with an additional driver.

However, a lot of the time people compile custom kernels for not so good reasons, including the following:

- You 'just need to' run the latest kernel. Distributions do a pretty good job of testing their kernel builds, and the latest greatest kernel isn't always a guarantee of the best stability.
- Performance. In the days of yore, a distribution would only come with a generic 'i386' kernel built for the 386 and not optimized for more modern, Pentiumbased chips. These days, distributions typically ship a variety of kernels for different processors, installing the kernel appropriate for the hardware.
- Your original kernel is 'bloated'. As modern kernels include most of their drivers as loadable modules, which don't take up any memory unless they're being used, there's very little performance advantage from building your own kernel without these modules.

### So, without any further ado, how to create a kernel package...

- Get any kernel-source package, or a tar archive from kernel.org.
- · Apply any patches you'd like.
- Install rpm-build, ncurses-devel.
- · make menuconfig.

This creates a program based on your current (possibly patched) kernel source to allow you to turn on and off options.

• make rpm.

Which will compile a kernel and modules and create a custom package for you to install. Simple isn't it?

There's a lot more to compiling source into packages than what we've covered here. Check out the links on freshrpms.net to learn more about packaging, and as always my inbox is open for questions.

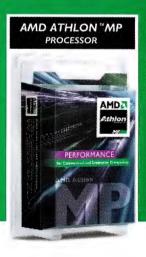
#### **MIKE MACCANA**

IT consultant for IT services group Cybersource in Melbourne. Linux queries can be sent to Mike at mmaccana @pcauthority.com.au









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# TABLE MANNERS

Are HTML tables God's gift to Web designers or the work of the devil? Tom Arah plots a middle way.

t's a hard life for the Web designer. Printbased designers can precisely set every feature of a page layout right down to the nearest thousandth of a point, but the absolute precision of PostScript is merely a dream for Web designers. Instead, they must work with the vagaries of browser-based HTML interpretation on a seemingly endless range of screen sizes.

Despair not, though, as it is possible to take control of your Web page layouts. You can start by appreciating that HTML's fluid nature - layouts automatically flow to fill browser windows of any size - is actually very effective for the Web as it was originally conceived; that is, for disseminating scientific papers. However, such crude, single-column layouts are hardly exciting and become virtually unreadable at the line lengths supported by modern high-resolution monitors and TFTs.

The original layout solution was pioneered back in 1995 when Netscape introduced new tags for dividing the screen into tables, which were quickly adopted by other browser developers and incorporated into the HTML 3.2 specification. HTML tables are tag-based so it's possible to create them from scratch in a text editor, but it's much easier to produce them interactively in a visual authoring environment.

Every HTML-authoring package lets you create tables via an Insert | Table command where you specify the number of rows and columns. On switching to code or split view, you can inspect the nested tags generated to create and lay out a simple two-column by two-row table:

<table width="100%" border="1" cellspacing="0" cellpadding="0">

The main element is the outer tag, which takes attributes that set the overall width (here 100% to fill the full width of the browser window); the border (here 1, so you can see the table grid), and the cellspacing

and cellpadding, which control spacing between cells and cell content.

Interestingly, there are no attributes for the most fundamental factor - the number of rows and columns. Instead, these are handled incrementally as they're downloaded in keeping with HTML's streaming nature. The opening tag tells the browser to start a table row, followed by any number of cells enclosed in and table data tags (the ' ' code for a hard space is added to prevent browsers ignoring empty cells). When the browser hits the closing tag it can render one completed row and start on the next, lining up the new data cells with the previous ones to

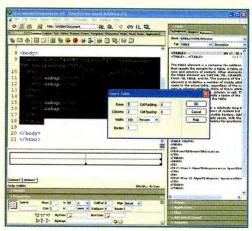
produce de facto columns.

This looks straightforward, but it's worth experimenting by creating a multi-celled table and randomly scattering varying amounts of text through it. Within your authoring program, columns start off equally spaced and each cell will grow vertically to accommodate the text as you'd expect, but preview the page in a browser and the results are very different - columns containing more content are wider than those containing less. Resize the browser window and the column widths will shrink and grow, both absolutely and relative to each other (and different browser versions might well produce different results) - bizarre behaviour that has reduced generations of designers to nervous wrecks.

What's going on? Remember that tags were invented to handle scientific data, and the browser's function is to show the tabular data on whatever screen size with which it's presented. It has its own ideas on how best that should be done - as Netscape puts it, 'complex heuristics are applied to tables and their cells to attempt to present a pleasing-looking table'. The problem for designers is that the results of this 'smart formatting' are often anything but



The secret of Web layout is the HTML table.



Tables are created with a few HTML tags.

pleasing, and clearly they need to take tighter control of the sizing of tables. In fact, this is relatively straightforward - at least in principle - as both and tags offer a 'width' attribute.

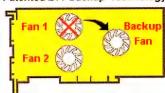
We've already seen the width="100%" attribute, which makes a table fill the full browser window. Other percentages allow you to set each cell to be a proportion of the total table width. More significant still is the ability to set an absolute pixel size, so will create a cell/column 500 pixels wide irrespective of the size of the browser window. Width isn't absolutely fixed as it would be in a DTP application, though, because cells can still expand if they're too small to contain their content (say, an embedded bitmap image),

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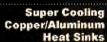


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With spanning and nesting, you can build more advanced layouts.

or if some later cell in the same column has a wider setting.

Nevertheless, this is a huge step toward the control you need for laying out Web pages. The first decision is the most important - assuming you want a fixedwidth layout, how wide should it be? You're still faced with the fact that screen sizes vary, and if you set a table width larger than the window your users will have to scroll horizontally to read each line (which they won't do for long before fleeing). An obvious solution is to aim at some lowest common denominator, which on desktop PCs is 640 x 480. Then you must consider scroll bars and different browser setups, again aiming at the lowest common denominator (in this case, Internet Explorer 4.5 on a Mac). Playing it very safe leads to a maximum pixel width of around 580.

#### Side-by-side

But of course, the main advantage of a table is side-by-side text. The classic Web layout is a separate column of alternative page links to the left of the main body copy, easily achieved with the Table | Insert Column command that automatically adds extra elements to the existing elements (much simpler and safer than hand coding). By default, these cells have no width attribute, but you can change this by interactively dragging on the cell side. Note, though, that in many applications the resulting widths won't add up to the full table width, so it's better to set them manually. A width of 130 pixels for the links column leaves 450 pixels for the main copy column. This might not sound like that much, but at the default browser text size

leads to readable line lengths of around 12 to 15 words.

This two-column by one-row layout is still pretty basic, but you can quickly add more rows and columns via Table | Insert commands and, crucially, merge adjoining cells using Table | Merge Cells. A glance at the code shows that this is achieved by two new attributes: colspan where a cell straddles multiple columns, and rowspan where it straddles rows. An obvious use is for a table of scientific data where you'd create a first title row spanning the width of the entire table.

However, that's not the only use for cell spanning. There's nothing to stop you merging cells anywhere in a table grid, which opens up much greater design potential. You can similarly use Table | Split Cell... to further subdivide a table grid, achieved not by any new attribute but by adding extra blank elements, then applying appropriate colspan and rowspan attributes to surrounding cells. Alternatively, if you want to split an existing cell into multiple rows and columns, simply use Insert | Table, repeating this process to create multiple-nested tables.

Returning to our simple two-column layout, you can add a new row with Table | Insert Row, then merge these two cells to create a single-header cell straddling the whole layout – ideal for a typical Web page banner. Then insert another row above the page links and body copy rows to contain links to the main site sections.

Finally, merge these cells and insert a new one-row by six-column table into which you can enter the links.

Using these few commands, you've created the basic banner / section links / page links / body copy framework that you see on so many Websites and, more to the point, you've learned all that's necessary to create far more advanced page layouts.

For your home page, for example, you could subdivide the main body copy cell into a grid into which you drop taster stories and links. Or you could increase the width of your layout by adding a new column down the right, which means targeting larger 800 x 600 displays. However, if you make sure that no column is more than 580 pixels wide, users of smaller displays will only have to use the horizontal scroll bar once to set up their reading of the main copy. There's one final thing you need to do: set all elements' border attributes to zero to hide the grid on which each page is built.

Using these basic tools, you can build any layout so long as it's based on non-overlapping rectangular components. You've

gained pixel-level control of your design, at least horizontally, and you can achieve similar vertical control thanks to the element's 'height' attribute (again with the proviso that the cell will always expand to contain its content). This is almost DTP-level control, so the obvious question is: why can't we have a DTP-style implementation?

In fact, this is exactly what WYSIWYG authoring packages like NetObjects Fusion have always offered: drag text and picture blocks onto the page and, behind the scenes, Fusion generates correctly sized tags to reproduce that layout in a browser. Rather more advanced is the system pioneered by Adobe's GoLive, and then picked up by Dreamweaver with its Table Layout view, where you drag a Layout Table container and then, within its area, drag into position and size Layout Cells to hold the content. As you do this, you can see the outlines of the complex col-spanned and row-spanned table grid that will produce the final desired results.

We've come a long way from those original browser-interpreted columns of scientific data. Tables are the secret behind the layout of almost every Web page, but before getting too pleased with ourselves let's take a reality check by looking at the code. It isn't a pretty sight. For example, the HTML for a typical grid layout produced in the Table Layout view consists of reams of tag code, with vast numbers of empty cells outnumbering a few tiny oases of content.

This isn't exactly how Tim Berners-Lee imagined the semantic Web, but so what if the code is complex – if it does the job, does it matter? Well yes, and for one overriding reason: efficiency. For a start, complex table code affects efficiency in terms of editability – the more advanced the table layout, the more difficult it is to edit. Table cells aren't actually selfcontained DTP-style text and picture boxes, so every time you want to move or resize one it will have repercussions on the layout as a whole. Even minor adjustments can be a nightmare (and you can forget about easy repurposing).

#### Under the table

However, the complexity of HTML table grids is even worse news when it comes to rendering. We've already seen that, unless pinned down, different browsers will interpret the same tags differently, but with more complexity there's more room for disagreement – like how to handle mixed pixel and percentage attributes, or

column widths that don't add up to the table width – and hence more danger that the layout will break.

On top of which, remember that even the best table layout is never absolutely fixed. All it takes is for the end user to change their default text size so that a cell has to expand to contain its content and your carefully constructed table can fall apart like a pack of cards. Things are certainly better than they were, but it's still necessary to check your table layouts against the most common viewing setups to ensure there aren't any nasty surprises hiding in the rafters.

The real problem with tables is even more fundamental than this: browsers were designed to efficiently display tagged text, but these days, because of tables, many Web pages contain more tags than text. In other words, the browser's primary task has come to be rendering the table rather than its content.

That's bad enough, but the way HTML tables render incrementally row-by-row as the code downloads proves to be fundamentally flawed in highly designed documents. The system works as intended for regular, fixed-column tabular data, but in advanced layouts the browser might well find that later information - a new column width (whether specified or content dictated) or even an entirely new column - can retrospectively affect everything that's already been rendered. In Netscape, you often see this as disconcerting on-screen re-juggling, while in Explorer table rendering is usually delayed until every in every last nested has been parsed.

Suddenly, HTML tables appear in a far less attractive light. Rather than being saviours, tags are more like unwelcome parasites overwhelming their host with reams of inefficient and unreliable code that flouts HTML's original principle of streamlined, flexible and fast rendering. Surely, there has to be a better way?

There is and it's called Absolute Positioning, which shifts Web page layout control out of HTML and onto the dedicated CSS2 (Cascading Style Sheets Level 2) in much the same way that text formatting is best handled by CSS1. Absolute Positioning is definitely the way of the future (and a future column), but until reliable browser support arrives and a critical mass is reached HTML tables will remain the layout mechanism of choice for the majority of Web pages. So the obvious question becomes: what can you

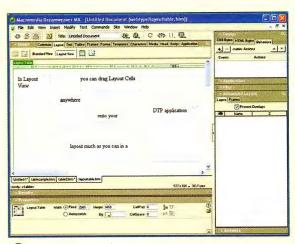
do to optimise their use?

The secret is to look at your tables from the browser application's point of view. To render the table as efficiently and reliably as possible, the browser needs to know as much information as soon as it can. That means specifying all attributes like cellpadding and cellspacing so that there's no scope for a varying interpretation. You also need to specify column widths once and for all and as early as possible, preferably in the first row, and to make sure you don't mix percentages and pixels and that your figures add up. And you need to be certain the content you intend to put into your cells will fit.

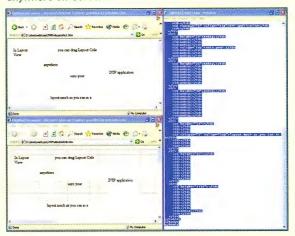
You can also help the browser by adding HTML 4's <col> and <colgroup> elements to specify the number of columns and their width upfront, although authoring and rendering support is currently patchy. If you've set up your table and column widths correctly, you can use CSS2's {table-layout: fixed) property to switch supporting browsers to faster incremental rendering. Adding information in this way helps the browser render

your table, but the best approach is still to keep it simple. Most importantly, you should avoid the code bloat involved in mimicking WYSIWYG DTP-style content box layouts.

This principle can be taken further: by their nature, features such as rowspans and nested tables delay rendering, so the more you break up your tables into simple incremental units the better. With that classic banner / site links / page links / body copy layout, for example, you could actually treat each cell as a separate table (you'd need to left-align the page links table so that the two tables appear side-byside). This means each page element can render independently as it's downloaded rather than being tied to all the others. The actual rendering time for the page as a whole will be roughly the same, but the fact that some content appears quickly can make the psychological difference between a text-heavy page being read. . . or left to



In Table Layout view, you can add Layout Cells anywhere on-screen. . .



the code and you can see the downside of such handling.

render unseen.

HTML-based tables have a huge amount to offer the designer (try imagining the Web without them), but it's important to recognise that they're a double-edged sword. Ultimately, the most important tool when it comes to designing your Web page layouts isn't your powerful-but-profligate authoring package but a pencil and paper, with which you can hone down your design to its bare but elegant essentials.

#### TOM ARAH

Tom Arah set up his design company in 1987. As well as design work, he now provides training and consultancy. He can be contacted at tarah@pcauthority.com.au

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# **BROADBAND RISING**

Dial-up too slow for your business? Siobhan Chapman takes you through the basics in choosing a business broadband plan.

f your business is connected to the Internet and you're managing multiple dial-up accounts for the PCs in your office, it may be time to consider switching to broadband. Perhaps your business has multiple PCs in use that aren't all networked and it's become too expensive or impractical to continue juggling phone lines and multiple ISP accounts to be worthwhile. Considerable savings can be made by sharing one broadband connection between all staff members and the availability and affordability of broadband technology has improved in recent times, putting it within the scope of small businesses.

According to a recent report from analyst firm IDC, more and more small to medium businesses are looking to migrate their connection to a broadband account, while those SMBs that have already gone down the broadband path are expected to increase their existing investment on broadband services.

The IDC survey - which had over 200 responses by SMB communications managers - found that the broadband technology showing the highest user growth rate in Australia is DSL (digital subscriber line). Out of the respondents, 49.5 percent had deployed DSL this year, up from only 25 percent in 2002. Australia's biggest carrier, Telstra, has the lion's share at 50 percent of respondents, followed by Optus with 8.2, AAPT with 7.1, iPrimus follows at 1.5 and the rest share the remaining 23 percent of the market.

In addition, an onus has been placed on the government to increase availability and reliability of broadband, both by providing direct support and by ensuring the regulatory regime promotes competition. In January this year, the Broadband Advisory Group (BAG) released a report to the federal government labelling broadband as the catalyst to spark the next wave of economic growth. BAG quotes consultancy Accenture as estimating that, if Australia adopts broadband as universally as the telephone over the next 25 years, it could reap economic benefits of between \$12 and \$30 billion per year. BAG warns, however, that Australia is struggling to match our global counterparts in both adoption rates and bandwidth. The report makes 19 recommendations that address the issues of broadband infrastructure, availability and affordability. The aim is to ensure broadband 'is available to all Australians at fair and reasonable prices' and elevate Australia as a world leader in its use.

This all means that there are thousands of SMBs out there attempting to navigate Australia's highly competitive and confusing broadband market. If you're the person charged with the task of wading through the vagaries of connection types, service level agreements and broadband plans, how can you make sure you pick the right plan to suit your business needs? This feature will attempt to make sense of the mayhem.

#### Identify your needs

There are many things to consider when choosing a broadband plan. What types of connections are available in your area that best suit your business needs? ADSL for example is only available if you are within 5km of an exchange that has suitable equipment installed. If you're in a more remote location you may need to consider satellite. Others may want the roaming capability that wireless offers. You must also identify the needs to be met by the business such as budget or a certain amount of bandwidth.

Technical needs must also be weighed up. Will your company require email, Voice over Internet Protocol (VoIP) or a Virtual Private Network (VPN)? What is your download requirement? Is uptime critical enough to your business that you need a guarantee?

On top of this, with broadband providers popping up like mushrooms, combined with dynamic market forces in the telecommunications industry, means businesses must ask basic questions to avoid getting burned, says Glen Noble, General Manager Hosting Solutions at Macquarie Corporate Telecommunications. Noble stipulates price is not a differentiator and offers a checklist that businesses can use to guard against poor quality service and unexpected cost blowouts (see Checklist boxout).

'You get what you pay for,' says Noble. 'Buying ignorance and shopping on price alone is dangerous.'

Chris Dalton, Project Director at Broadband Xchange says the most common mistake he sees small businesses make when picking a broadband plan is a lack of proper cost benefit analysis around its implementation.



The NOIE Website is a great first step when searching for information on broadband technologies.

> 'Implementing broadband is not just a matter of negotiating the best rate from a broadband service provider, but also involves looking at the impact of broadband on the business as a whole. A minimum cost plan does not necessarily lead to maximum benefit,' Dalton says.

Broadband Xchange is a project initiated by the Service Providers Industry Association (SPAN) made up of Australia's leading carriers, service and content providers and support organisations such as equipment and technology suppliers, consultants, legal and professional services. Head over to www.broadbandxchange.org, for a great resource when looking for more information on broadband. Working with the National Office for the Information Economy (NOIE), Broadband Xchange has produced a booklet that steps SMB's through the planning stages for evaluating and implementing a broadband service, which can be downloaded at: www.noie.gov.au/publications/NOIE/ eBusiness/Broadband/index.htm

#### Add it up

Kylie Hutchison, Product Manager at Pacific Internet advises you plan for the inevitability of broadband growing within your business. 'Upgrading from narrowband to broadband could change how much you rely on the Internet to do business. It is important to reassess your Internet data needs as they are going to change very quickly.'

Hutchison says the three fundamental points to bear in mind when shopping for a plan are:

budget, reliability (mission critical) and future expansion of your business. An ISP will need to know how much data you need, how important uptime is (guarantees of reliability cost more) and your budget, in order to find the best plan for you. SMBs need to assess how important work flow is to the connection and how the business will expand in 12 months.

'Look at the number of staff you have now and in the future and whether you will be operating from additional locations. Will you have new offices by the end of the year? Which state are they likely to be in?' she says. 'The vast distances we know and love in Australia make a difference in your communication needs. You can lessen the impact of expansion if you know what is coming up.'

Dalton agrees, 'At the start, broadband may be justified purely in terms of the cost of a minimum broadband service. With experience, the application can be progressively extended to cover improved back-office systems, online marketing through use of a Website and the adoption of e-business practices such as online billing and payments, through to teleworking by enabling employees to work from home using a VPN.'

Dalton suggests SMBs obtain independent expert advice to assist in planning and implementing a broadband strategy. One such resource is broadbandchoice.com.au which offers a search tool to find the best plan and also hosts a forum where users and ISPs discuss outages and swap information about providers.

Another excellent resource for small businesses is www.ozcableguy.com which is run by independent broadband network integrator Darren Stribning. While broadband provides the speed so that several people can use the service at once, the technicalities of how to actually achieve this can prove elusive unless SMBs network the 10 or so office PCs correctly. Stribning's Website addresses this gap.

Stribning says a common failing many small businesses make when picking a broadband plan is around billing. Too often business users choose a plan that is 'either overkill or underkill' and excess usage charges can accumulate into rather large sums of money.

'In some cases someone might be paying through the nose for a high-end service when needs could have been met by a cheaper

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Discussion forums can be a good way to track ISP reliability by seeing what their customers say about the service.

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This site highlights the many off the shelf networking products available to small business users, with quides and tutorials.

service,' Stribning says. 'Obviously without prior experience it's going to be difficult to determine exactly what Internet usage is going to be like the first time an office goes live on broadband, so it's important that the ISP provides some sort of accurate usage meter with notifications as the limit is approached.'

To calculate your business and technical requirements for broadband, Stribning says you should take your existing dial-up usage and multiply it by the number of staff going online in your office. This should provide some insight into the cost savings you can achieve by consolidating multiple accounts into one broadband account along with an inkling of the best speed to select.

#### Ways to get connected

There are four main types of broadband connection available to business in Australia, depending location: wireless, cable, DSL, and satellite. There are pros and cons with each technology that need to be considered when deciding which suits your needs. Your choice will also depend largely on which technologies are available in your area. The best place to get initial advice is your local ISP.

'There is no simple formula that will help an SMB determine the most appropriate delivery technology. The benefit of a growing market is that an SMB now usually has some choice about the type of technology, the speed of the broadband service and the quality. So ultimately choice depends on what the SMB is prepared to pay matched against the cost savings and revenue increase implementation a broadband service will deliver,' says Dalton.

#### DSL

DSL, particularly ADSL is the top choice for most SMBs due to its lower cost than other technologies and the faster speeds than dial-up. ADSL's main advantage is there is no need for extra access infrastructure as it uses the existing phone line, yet it does not tie up your phone line while you're online.

# CHECKLIST FOR BUSINESSES EVALUATING ADSL BROADBAND SERVICES

- Price is not a differentiator you get what you pay for.
- Beware of home services masquerading as a business offering.
- Read the fine print. Advertisements with cheap prices often have hidden rosts associated with downloads.
- Identify over-subscription/contention rates. The lower the over-subscription rate the better.
- Does your supplier guarantee throughput not just burst speed?
- Check for an uptime guarantee.
- How often is uptime measured? Be careful if an ISP is measuring uptime over longer time periods as they can average out the time the network is down and avoid paying penalties for poor service. As a minimum, uptime should be measured monthly, and any refunds should be paid within an acceptable time period.

- Get cash back, rather than a credit, if the provider doesn't deliver on their service promises.
- Who is responsible for what —
  particularly installation? If multiple
  providers perform different functions, it
  is harder to get a supplier to take
  ownership for making the solution work.
  To guard against finger-pointing, find a
  supplier that provides an ironclad date by
  which the service will be installed and
  beware of small 'cop out' clauses.
- What type of help desk service is on offer to customers? Identify how support is delivered and within what time frame.
- Are sufficient static IP addresses included in the package?

Supplied by Glen Noble, General Manager Hosting Solutions, Macquarie Corporate Telecommunications.



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EVERYTHING CONNECTED

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While strong market competition has lead to some great bargains, some of the cheaper plans have been criticised for reliability problems. If the occasional loss of service is going to be a problem, choose an ISP with a backup service or a good service guarantee.

ADSL is not available everywhere. Your local telephone exchange must be ADSL enabled. If your premises are more than 5km away from your exchange, or you are in an older apartment block and Telstra has used a technology called pair-gain on the phone line. ADSL may not be available. Check with your potential ISP. Broadbandxchange's Website also has a tool that allows users to search whether DSL is available in their area.

#### **ARE YOU SURE** THAT'S A BUSINESS PLAN?

- 1) Does my service come with a Service Level Agreement (SLA),
- 2 How can you assure me of a quality connection? What are your oversubscription rates? Make sure typical latency and packet-loss service speed can I lodge this slow
- 3 What are your service restoration targets? Longer than four hours is bad.
- 4 Do you use your own network where wholesale offerings as infrequently as possible? This is a check to see if the service provider is using best of
- (5) Is a router provided with the service or just a modem? Modems mean client software loaded on individual PCs in the business and difficulty in tracking lay blame with the business' network it also has basic firewalling protection built-in for common applications.

#### Cable

Cable Internet, also a popular choice, uses existing pay TV cable networks to deliver Internet access. While cable is probably the most limited in coverage, it's cheap, reliable and very fast. Two examples are Telstra's BigPond Broadband which uses the Foxtel cable and OptusNet Cable which uses the Optus television cable. As with ADSL, cable does not tie up your phone line and there is no need to dial up. It also offers access to pay TV if you want it and sometimes can be cheaper than other technologies. But while it's very popular among home users, business can also take advantage of the technology.

'Cable is my optimum choice for many small businesses provided the usage limits are adequate and a static IP address isn't necessary,' says OzCableGuy, Darren Stribning.

But again, cable is not available everywhere.



Broadband Xchange offers a handy tool to check whether or not DSL is available in your area.

The physical cable must run past your office building for you to be able to use this service. Some multi-tenant buildings may not be cabled internally. To check whether cable is available in your area, go to the Optus site www.cable.optusnet.com.au/availability.html or the Telstra site www.bigpond.com/broadband/ access/cable/caniget.

#### Wireless

By doing away with wires, wireless broadband can be ideal for places where it is not possible to run cables or drill holes, such as within historic buildings. Arguably the most attractive feature of the technology is that it can give users broadband access even when they are away from their office.

The most common wireless technology in use for high-speed data is WiFi (Wireless Fidelity), which is based on IEEE 802.11b. Currently WiFi is being used to provide public high speed Internet access in locations such as cafes, hotels and airport lounges for mobile workers. WiFi is implemented using a wireless PC card, and communicates with a



Both Optus and Telstra offer services on their Websites to check if cable can be connected at your home or workplace.

local access point. From there information is transmitted via a land-based cable or ADSL link to your ISP.

However industry observers say more work needs to be done to make wireless a more viable option for small businesses. Compared to ADSL or cable, wireless has a relatively high initial outlay. Further, WiFi shares the airwayes with devices such as microwaves and cordless phones, which can use up bandwidth, or cause interference on occasions.

The most notable disadvantage of wireless is that it suffers from potential security risks. As radio waves travel in all directions, anyone within range and with the right equipment can access an unsecured network, be they in the next office, the next building or on the street. However, security measures for wireless networks are continually being upgraded.

'Wireless Internet is at an experimental level at this stage, and in particular has some questions of security to be answered. I expect to see some huge advances made in this type of broadband access over the next year or so in Australia as equipment prices drop, wireless data speeds increase and encryption technology improves,' Stribning predicts.

Satellite is most useful for those in remote areas where other technologies are not available. It can also be attractive for businesses that wish to provide access to dispersed offices as a single satellite service can support a large number of users within the same 'footprint'.

Satellite connections come in two forms one-way and two-way satellite.

One-way satellite solutions do exactly that operate in only one direction, which means while you can download information from the Internet at high speed via satellite, you can not send it, so you still need to maintain your dialup modem or ISDN connection for your uploads. This means that your phone-line is tied up while you are accessing the Internet and you still need to pay for a dial-up account with your Internet service provider. Two-way satellite is able to send and receive information at high speed through the same satellite dish, but is more involved and expensive as you need powerful transmission equipment, and not just a receiver.

Satellite is also more expensive than other technologies in terms of infrastructure, installation and use and the connection can be affected by exceptionally heavy rainfall.

#### Domestic mutton dressed up as lamb

There are a considerable number of broadband suppliers that resell basic domestic services — wholesaled by one of the larger carriers — as a business service. To counter this, businesses should ensure they are not getting a domestic service masquerading as a business offering.

Noble warns that this phenomenon is particularly prevalent among DSL offerings

#### THINKING ABOUT AN ISP? FIRE THESE QUESTIONS AT THEM

When SMBs are considering a broadband connection, the questions they should be asking an ISP are:

- Which broadband technologies does the ISP offer?
- What is the connection and/or installation fee?
- What fees and charges apply installation, monthly access, excess usage, cancellation charges and any additional hardware charges?
- Is there a download limit and if so how is it calculated and applied?
- What is the maximum speed of the connection (upload and download)?
- Is the new system scalable if my business grows?
- Is there a service level agreement guaranteeing a minimum level of performance for speed and reliability?
- What are the terms and conditions of the contract and acceptable use policy?
- What tools are available to manage download/upload usage?
- · What support is available?
- Am I able to change between plans as my business needs change?

Source: The Broadband for Small Business guide published by NOIE and Broadband Xchange: www.noie.gov.au/publications/NOIE/ eBusiness/Broadband/index.htm aimed at the SOHO (Small Office/Home Office) market. Such services will not deliver the throughput and uptime required to perform even basic business functions, Noble says.

Hutschison agrees: 'The best way to check whether you are being sold a home connection is to ask the ISP what is the difference between their home and business services.

If it comes down to more mailboxes – you know it is just the same service re-branded. If it comes down to business grade customer service, freer network traffic, greater flexibility with product and data commitments and reduced rates for multiple locations, you are on a true business product,' she says.

#### To cap it off

Another hidden trap with broadband is to purchase uncapped at a higher monthly rate — and then get stuck with a 12-month commitment to a product that costs you twice as much as you could have paid had you purchased a capped product.

Capped usually refers to an included data amount which will supply you with a cheaper per-megabyte rate until you reach the limit. After reaching your limit, you are either charged for excess or your connection speed (usually download) is slowed.

Choose a product that allows flexibility with your capped amounts. Make sure you can change up and down as needed. Provided there is a clear understanding of basic and additional volume-based charges, you can make an informed choice about which is the most appropriate tariff plan.

#### Speed skills

Another fine point is identifying what the service provider considers a reasonable oversubscription rate/contention rate. These terms — which are used interchangeably — refer to the number of subscribers that a provider carries on its pipe from the local telecommunications exchange back to their switch.

But some providers may load so many users onto this pipe – oversubscribing – that traffic slows during peak times to levels worse than what you would get on a standard dial-up modem connection.

'Beware providers that will not tell you their over-subscription or contention rates,' Noble says. 'The lower the over-subscription rate the better. For example, a high quality service can be as low as 3:1. A low-grade domestic service could have as high as 200:1.'

DSL suppliers vary how they manage contention ratio. Some offer a guarantee of a minimum number of users, while others guarantee a speed minimum called CIR (Committed Information Rate) which means they will upgrade the line dependant on usage.

#### **Burst lags**

When talking about the speed at which your data is transferred, a provider typically gives you a 'burst' speed figure, for instance 2Mb/s, which is defined as the initial maximum speed that can be achieved on its network for the first few seconds of a download. Throughput speed is generally defined as the actual speed it levels out to and is considered a more meaningful measure of speed.

'Depending on the needs of your business, a provider should guarantee a level of throughput that can be sustained at all times, even during peak periods, as chances are this is when you will need it most,' Noble says.

#### Cash back?

If a service provider does not live up to its side of the contract and fails to meet its service level guarantee, businesses may be able to get a cash refund or a credit. But it's important to check the fine print.

Many service providers offer a 99.9 percent SLA, but sometime this figure can refer to a network availability target rather than a guarantee. Industry commentators say too often the SLA only provides rebates in response to an outage, and a response can just be the acknowledgement of an outage.

Hutchison advise businesses users determine:

- What the rebates are payable in terms of how much you pay. Is data separate?
- What is the supplier willing to guarantee on the network?
- ② Does the guarantee include everything up to your equipment?
- ② Does the guarantee include Internet access? Don't be shy about checking the procedure for claiming refunds and rebates. 'Some carriers have prohibitively detailed processes that make it harder to seek compensation. Understand there is a difference between a target and a guarantee always seek the latter,' Noble says. Also check whether the provider will give cash or credit. If it's credit, 'you may have to stay with a poor quality service provider.'

#### Haggling

It's always worth asking whether you can negotiate on price. This is a very competitive market and business customers are in a great position to put together a deal that suits them.

Hutchison says: 'Step outside the world of Telstra BigPond and you will find a range of hard-working industrious service providers who will "bust a gut" to get your business.' Putting on the pressure during the sales process is also a great way to 'test the mettle' of your ISP, Hutchison adds.

'How you are treated during the negotiation of the service is often a hallmark of what you can expect for the life time of the service.'



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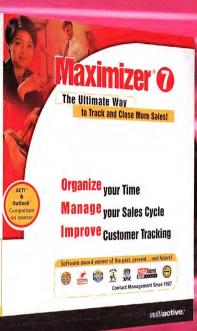
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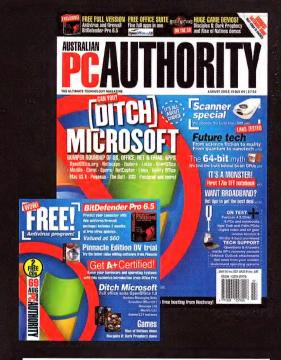
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### DIGGING DEEP

**Jon Honeyball** goes it alone this month and tackles the thorny issue of disaster recovery.

f you've ever been faced with disaster recovery, you'll know that it's a problem best approached with a clear mind, lots of structured thought and more than a few sheets of A4 paper on which to carefully write down what you need to do and in which order. Far too often, what was merely a minor drama gets turned into a full-blown crisis because of the well-meaning but ill-informed dabbling of people who don't have a clue what they are doing.

This is all too frequently the contribution from senior members of a company (especially in the SME/SoHo environment) who have even been known to take the most drastic of steps to fix some tiny, niggling problem. Believe it or not, installing the operating system – note I said 'installing' and not 're-installing' – has been used before now as a 'cure' for Word having the wrong size of paper set as default.

While I agree with anyone who objects that maybe it should be made easier for mere mortals to debug these things, it still doesn't excuse the wholesale fiddling that so often occurs. Attempting to fix the newly magnified disasters that result becomes a task rather like following the elephant at the circus, armed only with a bucket and spade.

And, as I'm having a general moan, could I point out that care should be taken when dealing with the person who has the hapless task of digging your computer network out of the hole into which you tipped it. Asking every five minutes if the network is going to be working again shortly is the sort of interruption that's guaranteed to turn the most mild-mannered of IT consultants into a green facsimile of the Hulk at a moment's notice.

Having said that, we're often to blame for bad communication and the setting of unrealistic expectations, and the software itself sometimes doesn't help. A good example is what happens when an Exchange Server crashes. Experience shows that this is rarely due to any grotesque instability in Exchange Server itself or the underlying Windows Server, as such installations tend to be standalone

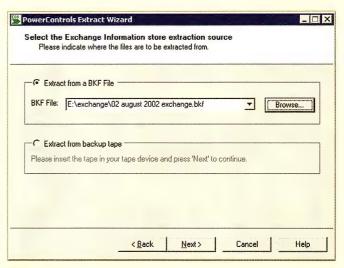
application servers that aren't required to do other tasks (like running the office Quake network server) and hence should be stable. But nothing short of full-scale clustering can get around a bona fide failure of the hardware that lies beneath.

Getting a dead Exchange Server back up and running is one thing, but getting the underlying OS sorted out especially if this is a

single-server, small-business solution where you have Exchange Server 2000 installed on top of Windows 2000 with Active Directory, all running on the same box – is another level of complexity and hence takes time. Meanwhile, it isn't unreasonable of the users to be worried about whether they're going to get their files and emails back.

In today's world, getting access to vital emails can be more important than the file system itself, because often the files are stored as attachments to emails, and emails form the lifeblood of the ongoing communication of a company, both within and without. So you can imagine how tense things can get if you discover that you can't get Exchange Server running and that the backup tape drive has fallen over and you're worried that the EDB files are lost.

Let's describe a possible scenario. You're presented with a backup tape from 15 months ago, and its owner cheerfully states that there's an email on there, now long-deleted from the current system, which must be retrieved. No excuses will do – you have to get this email back. What do you do? One obvious solution is to build a new server, set it up to pretend to be the main server and then to do a recovery of Exchange Server onto that system and



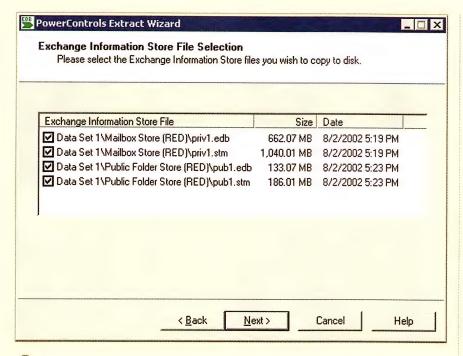
Lost your EDB files? No worry for PowerControls, which can retrieve it from a BKF backup.

thus bring the data back online. You can then hook up a copy of Outlook to the new server and dump out the required emails to a PST file.

All of this takes time, and not only does time equal money, but often 'now' really does mean 'now'. Worst of all, you're due at the pub in an hour and that certainly doesn't leave enough time to do a scratch install, Exchange Server install, data recovery and email extraction. What do you do?

And here's a second common scenario. You decide, after much deliberation, that your Exchange Server is a bit 'Donald Ducked' due to an unidentified permissions screw-up buried somewhere deep in the system. Maybe you'd done something unwise like DCPROMOing Active Directory onto your Exchange Server member server (or, worse still, DCPROMOed it off again). Anyway, you decide it would be a good idea to back up all the Exchange Server data, uninstall and reinstall Exchange Server. Then you can restore the data and everything will be just fine.

So you trot off down this apparently sensible path, only to discover near the end that the backup information won't restore onto the server. You had complete faith in the workability of your backup /



#### And here's the proof: a BKF file opened up to display its contents.

restore procedure so hadn't bothered making a PST local file copy of your Exchange Server inbox, but now the beads of cold sweat suggest this wasn't such a bright assumption. What do you do?

#### PowerControls

Well, the first of these scenarios happened to me last week, and the second happened to a friend only last night. Fortunately, I had a tool on hand that made the problem-solving a matter of a few mouse clicks. Not only does it genuinely work, it works so well system admins will have to find new ways of padding out their timesheets. The tool in question is called PowerControls 1.1 from Ontrack, a firm well-known for its clean-room hard disk-recovery facilities.

Ontrack's programmers obviously wrote PowerControls to help unpick the sort of mess they must see on an almost daily basis, and its basic premise is simple – to open up the core EDB database files from an Exchange Server installation and allow you to browse them and extract any item at will.

To understand why this is significant, let me point out as clearly as possible that you don't need to have Exchange Server installed or running, or even within 100 yards of the scene. This tool works directly on the underlying data files themselves. You don't need to be working on a server or anywhere near Active Directory. You don't need to be on the source network because there's no authentication required or desired. PowerControls, like an orange, simply unpeels the EDB database files and lets you peer inside. . . and poke about the soft innards.

At this point, you may be wailing that your Windows Backup creates a BKF file so you don't have the EDB files. No problem – one of the functions of PowerControls is a Wizard that you can point at a BKF file, which looks inside and extracts the EDB files for you. And if you have everything stored on a tape drive, you don't need to recover to disk, as PowerControls will control your tape drive and extract from the EDB files held on that.

How is all this presented to you as a user? The program looks rather like a mutant form of Outlook: in the upper half of the screen is an Outlook-esque tree view of your mailboxes, which is the source window, while the lower half is the destination window.

Let's go back to my first disaster scenario – recovering an old email from a backup file. PowerControls' Extraction Wizard pulled the EDB files out from the BKF backup file and dropped them onto the local hard disk. I specified that I wanted to use a local PST file as the destination container, and once I'd specified this PowerControls went right off to work and opened up the EDB file

for my inspection.

There I could browse all the mailboxes that were stored on that EDB storage group, drill down into each one and then be presented with the usual Outlook-alike set of containers – Inbox, Drafts, Deleted Items, Contacts and so forth. I drilled down into the inbox to a subfolder the user had created and found that vital email message complete with its attachment of a Word document. A quick drag-and-drop deposited a copy of the whole thing into my PST file. I could then take the PST file to the anxious user, mount it up into Outlook and magically recover that old email into his inbox for him.

Total time from start to finish? Under five minutes, honestly. See what I mean about padding out the timesheets? Perhaps I should have acted up a bit, making several cups of strong black coffee and being heard to mutter ostentatiously 'it's not easy this, it's taking time, I'm going as quick as I can' before disappearing back into the machine room, taking off my shoes, putting my feet up and reading the newspaper for at least a couple of hours so that a more credible length of time had gone by.

But I have to come clean with you – it was the matter of a few minutes only, and that included learning the UI and reading the online help to make sure I was doing things in the right order. It would have taken longer if I'd had the backup on a tape, because some degree of tape shuffling and reading would have been required. But this was a disc-targeted backup system that was secondarily backed up to tape, so I had a shiny BKF file to play around with already.

In the second scenario, my friend's home/office Exchange Server installation was acting a bit wobbly so he decided that a backup, uninstall and reinstall was just the ticket. Halfway through the evening, I got a sheepish phone call telling me that it had all gone horribly wrong and he wasn't able to restore the data. Maybe it might be possible to use this fabulous new tool I had been raving about only a few hours earlier? It would have been churlish to refuse, so he made a terminal-server connection into my network and transferred his BKF file over.

PowerControls allowed him to recover his entire inbox structure and all the mailboxes, contacts and calendars.

Although I'd been impressed enough with the recovery of just one email in my initial test, I was amazed that it recovered everything out of a complete Exchange

Server installation. Out of more than 20,000 messages, only a few weren't recoverable, the software complaining that they were corrupted (almost certainly by some age-old antivirus software). All the contacts, calendars, emails and so forth were dropped into the PST files for subsequent recovery into a fresh Exchange Server installation.

So PowerControls works, and works brilliantly. Are there any downsides? I should point out that you'd better keep your backup tapes, BKF and EDB files safe and secure because there's no password or security lockout here – load the file, choose the mailbox and away you go. There's nothing to stop you from diving into any of the data and, if you can do it, any cracker armed with this tool can do it as well

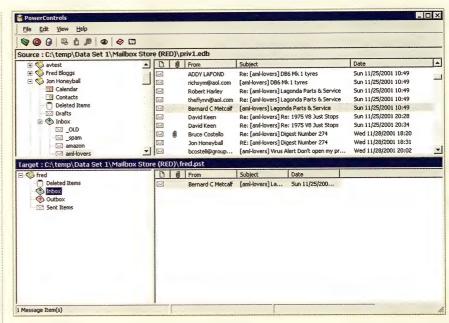
The only thing that makes this relatively unlikely is the high cost of the software — the standard version costs US\$950 per server and recovers up to 100 mailboxes. The Business version costs US\$1,495 per server and recovers up to 250 mailboxes, while for larger installations there's a per mailbox and per server–based pricing scheme. It's not cheap, but it's certainly not expensive when you need it. It's perhaps a little way over the price pain threshold for 'I'll buy that just in case I need it', but when you do need it nothing else will do.

I should also point out that PowerControls doesn't remove the need for a proper disaster-recovery plan for Exchange Server.

Indeed, such an event can now become a two-pronged affair – identify those key users who must have access to their mailboxes right now and use PowerControls to extract their data immediately. At the same time, start on the full recovery path. Some of this will get easier with Outlook 2003 when coupled to Exchange 2003, if you set up the local caching facility. In this scenario, a workstation just goes 'offline' from the server when the server disappears, but its user can still safely work with a local cache of their data.

However, this doesn't work with earlier versions of either software unless you've told it that each connected machine is a roaming laptop, which introduces its own, unique set of headaches. It's definitely somewhere you don't want to go.

PowerControls 1.1 has proven itself twice in two difficult situations and I honestly can't ask for more, so recommendation is mandatory. Contact www.ontrack.com where you can



PowerControls lets you drag and drop files within Exchange stores.

download a demonstration version so you can try it yourself.

#### Other Exchange tips

There are a few other things you can do that will help if Exchange Server goes sour. First, look at whether you have enough disk space and ensure Exchange Server doesn't actually delete things when you tell it to in Outlook.

This is called 'mail retention' and it can save your bacon. This is especially true if you set up Exchange Server to hang on to mailboxes even once you've administratively deleted them: the item to look for is called Deletion Settings and you'll find it on the Limits tab of the properties of the Mailbox Store.

Drill down to First Organisation/ Servers/Servername/First Storage Group/Mailbox Store and right-click on that and choose Properties.

On the Limits tab, you'll find a group called Deletion Settings, which has two entries: 'Keep deleted items for day(s)' and 'Keep deleted mailboxes for (days)'. There's a checkbox in here too called 'Do not permanently delete mailboxes and items until the store has been backed up'. What are good settings here? Start with 30 days for each date setting and turn on the checkbox. This way, you'll be sure that everything stored in your inbox and other mailboxes got into a backup set before it was finally deleted.

Finally, bear in mind that some companies operate a 'delete it all' policy,

which is especially common in heavily regulated spaces like pharmaceutical and financial companies that can't afford to have sensitive data sitting around.

In these organisations, you have to operate a 'clean inbox' policy by deleting anything after a specific date — often 30 days. The logic behind this is that anything considered important and worth keeping should be put into a company document repository, like Documentum or an equivalent, and that an email inbox is too small (or simply insecure) a bucket in which to keep important or delicate information and data.

Other firms insist that everything must be filed into public folder trees in Exchange Server, structured on a project, team or departmental basis, and thus there's no need for information to lurk in an essentially 'private' email store. I can see the merit to such solutions, provided there's a proper repository for information to be held for the long term.

All too often, though, companies just impose some arbitrary inbox storage limit on the user, who then has to frantically delete anything of any size to keep under the mailbox limit. Not only is this a grotesque waste of time in an era where disk storage is cheaper than it has ever been, but it also tends toward the inevitable destruction of the long-term information heritage of that company. Such hectic (and needlessly random) infoannihilation may come back to haunt in the future.

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# **OUESTIONS & ANSWERS**

David Moss is blown away by patch gueries and overzealous security.

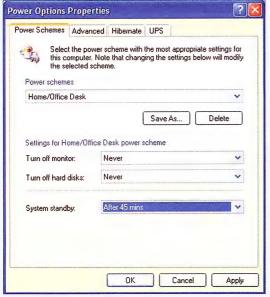
#### STAND OFF

I have my laptop running Windows XP Home Edition set to default to standby after one hour, but it never seems to happen. It will always go to standby if I'm using batteries, or if I change the standby time setting to be the same as I use on batteries (which is ten minutes). Is one hour too long? I've just upgraded from Windows 98 if that offers a clue. K Williams

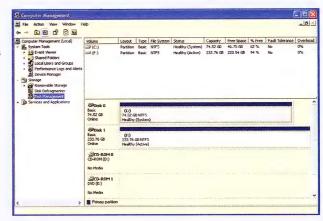
It does offer a clue, but only in the sense that it tells me that the problem would go away if you upgraded your new Windows XP with Service Pack 1.

As things stand, when a system runs under mains power, after a period of idleness of around 30 minutes the Windows XP Idle Task Scheduler takes the opportunity to run maintenance tasks on the machine. That would be fine were it not for the fact that it resets the System Idle counter so your system never reaches an hour of idle time meaning standby will never occur.

Setting a system to standby under Windows XP might not always give you the results you expect.



Update your system with Windows XP Service Pack 1 and the problem will go away, as a relevant patch is included in the Service Pack. Be aware that this isn't the only thing that will reset the System Idle counter - there are plenty of other applications, especially those that are running all the time, but I suspect you might find your problem solved after the upgrade.



OI prefer to have my system on one drive, and my data on another, and I'm not entirely in favour of having multiple partitions on a single drive if it's at all avoidable.

#### **BLOWN AWAY**

I have a number of partitions configured on a HP e-Vectra running Windows 2000, organised as C = Windows OS, F = programs (non-Microsoft), G = work, and H = backup.

I resized one of my partitions to provide more memory in C so I could undertake a Windows update; this appeared to function okay.

I then did the Windows update. Upon restart, it indicated, after the

> initial Windows 2000 Professional starting screen, '\*\*STOP:0x000007b (0xed41b84c, 0xc000000e, 0x0, 0x0) inaccessible boot device'.

I can't reboot into Safe Mode, yet if I boot into Windows from setup I can see files on the various partitioned drives.

How do I view data on the other drives if I need to access it?

If I reload Windows 2000. the HP CD indicates that this will reformat my main partition. Is this the C drive noted above or the entire disk? I don't want to lose all of the data on my disk, as it hasn't been backed up for

about a month (HP indicated that it didn't support partitioning).

Also, if I plug in a separate USBbased external drive, can I get any of the data copied from my various partitions onto it before I reload and reformat the whole disk, should this be required?

#### D R Bridge

I'm presuming, based on what I've read, that you have a single hard disk with a number of partitions on it, each one being assigned a drive letter. If that is the case, the best thing you can do is remove the disk from the system and place it in another system where it isn't the primary drive - otherwise you'll encounter the same problems.

Start that system (it could be running Windows 2000 or XP) and examine your drive. You should then be able to retrieve the data from the machine.

I further suggest getting at least one more drive for your system and placing your data on it. That way, your C drive should remain at a size where you'll never find it necessary to use software to resize your partitions.

If you absolutely must, don't do it with your OS partition, because the reason HP doesn't support partitioning on the system drive is that it blows its contents away when it does a full reinstallation.

#### WATCH THE PATCH

I've recently been getting some of my Windows 2000 servers up to date with patches that have been released since Service Pack 3.

Rather than my usual method of downloading every patch and QChaining them all together, I decided to use Windows Update and then manually apply any patches that haven't yet made it to that site. I did the Windows Update and then ran HFNETCHK to scan for any missing updates. What confused me is that HFNETCHK reported four patches missing that Windows Update had confirmed it had installed. So, I manually reinstalled those four patches, but two were still persistently reported as missing by HFNETCHK:

WINDOWS 2000 SERVER SP 3
Warning MS02-055 323255
File C:\WINNT\system32\hhctrl.ocx

has a file version that is greater than what is expected.

Warning MS02-070 329170
File C:\WINNT\system32\sp3res.dll
has a file version that is greater than

Windows Update and HFNETCHK might not always appear to agree, but sometimes it's all in the wording.



This is a confusing error message when you know that all the components are where they have been for some time.

what is expected.

As these are quite important updates, I'm perturbed. Add/Remove Programs reports patch 329170 as installed, but there's no mention of 323255. Yet Windows Update confirmed their installation.

You'll be pleased, if also irritated, to learn that the problem lies in HFNETCHK itself and that you were in fact correctly patched (all four patches) as Windows Update indicated. Microsoft is aware of the problem and is presumably working to resolve this reporting issue.

As I understand it, what HFNETCHK is in fact telling you is that the file versions on your system are higher than those in the patch information it holds. Windows Update sees this and says nothing, whereas HFNETCHK decides this is information you need to know. It's not saying you're unpatched, just that the

file version is later than the one it knows about. This sort of problem will rear its head every so often as patches keep coming thick and fast.

#### **CHANGE OF OWNER**

I was wondering if it's possible to change to whom Windows 98 is registered without reinstalling the OS. Plus, I have so many problems with my computer I don't know where to start. I often get BSODs with a range of different codes and messages. Can I get my computer files examined online, or something similar, to fix my problems?

Here is the most recent error:
'A Fatal exception OE has occurred at 0028:C00A9130 in 00028:C003638 at VxD VMM(01) + 00002638'.
B Hollonds

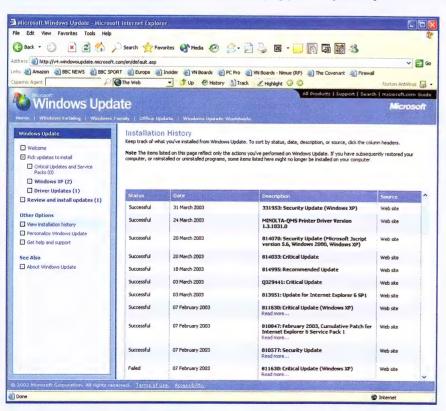
It is possible to change ownership details, but given the current state of your system I'd be doing you no service if I didn't recommend that you back up your data and do a complete reinstall of the OS (these are generally driver problems). Naturally, when you reinstall you'll be able to enter the new owner information.

#### **ACCESS DENIES**

I've been trying to discover why a database that was working fine yesterday should have failed this afternoon. The database was built in Access 2002, is a standard MDB file and has hitherto worked flawlessly. Today, however, trying to open a data access page in Design view prompted the appearance of the following error message:

'Cannot find the database or some database objects that this page refers to. Update the connection information of the page, or fix the references to the missing database objects.'

As far as I know, nothing has changed with regard to the location of any files – they're clearly visible in Windows Explorer – so I'm at a loss







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ISO9002 Lic 10107 Standards Australia to explain what's happening.

The only change that has taken place since yesterday was the application of a Service Pack to Internet Explorer. I can see that there might be a connection, but I'm not sure where it might lie.

W Fawten

This problem occurs when you upgrade Internet Explorer 6, or Windows XP, to Service Pack 1 and is caused by both of these service packs changing the way paths to databases are handled. This was done as a security enhancement, and you could say it has been somewhat overzealous, given that you can't access any data.

Fortunately, the solution is simple: open your offending page in Design view, right click on the page and select Page Properties from the pop-up menu.

You now need to change the way the path is represented, so click on the Data tab, right click on ConnectionString and then on Build.

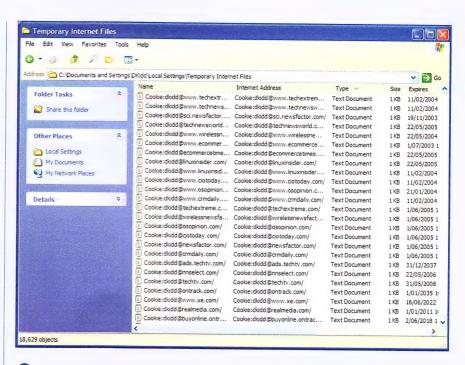
Now click on the Connection tab and change the relative path to the database you'll find there to either an absolute or UNC path name (that is, \\servername\\ sharename). I prefer the UNC version and don't favour absolute naming as it ties you to a specific point on the system.

These Service Packs also made some other changes across your system in the name of security, one of which is the blocking of email attachments considered unsafe by Microsoft.

This will affect you if you use Outlook Express, for example, but a quick trip to Tools | Options will find a security setting (location varies depending on which version of Windows you're using) that's labelled 'Do not allow attachments to be saved or opened that could potentially be a virus'. Obviously, you disable that at your own risk

The list is quite large, but in the majority it makes sense, so if you're expecting a file of a particular type – such as an EXE – it's best to have it sent in a compressed file format such as ZIP, or rename the extension

You can view the blocked files list at the URL below, and there's a link from that page to another that shows you how to modify the list: http://support.microsoft.com/default.aspx?scid=kb;en-gb;291369. Also see our *Tech Support* column this month which also shows you how to unblock attachments in Outlook Express along with Outlook (page 149).



Deleting individual cookies is possible under Internet Explorer, but finding the one you want can be a time-consuming process if you have a lot of them.

#### PLAYING THE PERCENTAGE

I often see filenames and paths in Internet Explorer full of percent [%] signs.

I can see that '%20' refers to a space in the file path, but what do the others mean?

J Nugent

A space in a filename or path is indeed displayed as '%20'. Other items that are displayed as percent signs with numbers are as follows: # is displayed as '%23'; % is displayed as '%25'; & is displayed as '%26'; and + is displayed as '%2B'. Knowing these codes should help translate those filenames.

#### **COOKIE MONSTER**

I know how to delete all of the cookies on my system, but I'm not sure how to get rid of individual cookies.

Could you also explain the difference between first and third-party cookies, as I don't know how to access the second set?

**G** Tamer

Deleting individual cookies from your system isn't a difficult task. Just following these steps:

1) With Internet Explorer running, go to the Tools menu, select Internet Options and then click on the Settings as opposed to the Delete Cookies button. The former will delete all cookies, but the latter will open the Settings dialog.

2 With the Settings dialog open, click on the View Files' button and then wait a while for the contents of the Temporary Internet Files folder to be displayed (the amount of time you'll spend waiting depends on the number of files and cookies that reside in the temp folder). I suggest that you then sort by type and head for the bottom of the list, as that's where all the cookies in the folder will now be located.

With regard to cookie types, first-party cookies are those sent to your system by the domain you're visiting in your browser. For example, if I'm visiting microsoft.com and it places a cookie on my system, that would be a first-party cookie. The key here is the domain, so a visit to http://msdn.microsoft.com would get me a first-party cookie from the microsoft.com domain.

However, if there's an advert on a page in microsoft.com from otherdomain.com, and that ad was set up so that when I visited the page a cookie would be sent to my system, the cookie would be a third-party cookie, as it didn't originate from the domain that I was currently visiting.



# RAPID RECOVERY

Even the best of us get a Windows problem so severe you can't even open the bonnet to fix it. **Ashton Mills** takes a look at the Windows Recovery Console.

earkening back to the primordial terminal-based soup from which all operating systems came, the Windows 2000/XP range comes with a special recovery console that sheds all the pleasant dressings to give you a bare-naked look into the sordid underbelly of your Windows operating system. Well, at least in limited form.

The Windows Recovery Console comes in handy when new drivers or applications misbehave to such a degree that they prevent Windows from loading properly, often heralded by a freeze during boot or something as unpleasantly familiar as a BSOD (Blue Screen Of Death).

Despite its modest trappings, the console is functional enough to provide access to your FAT, FAT32 and NTFS volumes and initiate basic recovery mechanisms to get your machine back on its feet, or at the very least recover your essential data before a format and reinstallation. As a result it's good to know how to install and use the Recovery Console should you ever find yourself in need of its services.

#### Accessing the console

There are two ways you can enter the Recovery Console, both of which require the use of your original Windows 2000/XP install CD:

# THE SAFE ALTERNATIVE

Don't forget that Windows Safe Mode, accessed by holding down F8 during boot, should be your first stop when trying to solve major problems.
Though ugly in its simple colour scheme and resolution, you at least have the familiar environment of the GUI and full access to all parts of your system. Often it's simply enough to use Safe Mode to uninstall the last program or driver you installed that caused the problem, and then reboot.

Of course, in the most severe circumstances it may be that even Safe Mode can't boot, in which case your only recourse is the Recovery Console.

1 While in Windows insert the CD into the CD-ROM drive, click Start | Run and enter:

d:\i386\winnt32.exe/cmdcons

Where 'd.' is the drive letter for your CD-ROM. You will then be prompted to install the Recovery Console as a boot up option you can select from the NT boot loader. This is useful if you won't always have your install CD at hand.

2 Restart and boot straight off the CD (ensure that your boot sequence is correctly set up in the BIOS) as if you were installing Windows. Press F10 during the splash screen, or alternatively you can select the Windows partition you want to initiate a recovery on and press 'R' to repair and then 'C' to start the console.

When you enter the Recovery Console you'll be prompted to choose which Windows installation, even if you only have one, to log into. You will then be prompted for the administrator password. If you haven't set one previously, just press Enter.

#### Using the console

Once you're in, issue the HELP command to see a list of available commands (See Recovery Console commands box). Note that while it looks like a standard DOS prompt, it's not quite the same. The console is securely designed to prevent abuse, and as a result there are a few default limitations:

- There are a limited number of commands, and although some of them have similar names to their DOS counterparts, their functionality is often greatly reduced. Check what each command is capable of by entering the command with a '?' switch.
- Only the root directory, %systemroot% directory (by default, \windows) and system folders belonging to Windows are accessible. All other directories are off limits.
- You can't use wildcards for certain tasks like deleting or copying and you can't copy entire folders. This can make things exceptionally tedious if you need to copy a large number of files from one partition



nstalling the Recovery Console as a boot option.

Microzoft Windows XPCHY Recovery Console.

The Recovery Console provides system repair and recovery functionality.

Type EXIT to quit the Recovery Console and restart the computer.

1: G::WINDOWS

Which Windows installation would you like to log onto

(To cancel, press ENTER)?

The Recovery Console. It's not pretty, but its functionality belies its simple looks.

to another.

• While you can copy files from removable media (such as a floppy) to the hard disk, you cannot copy files from the hard disk to removable media. You can still copy files between partitions on the machine, however.

This should be fine if all you need to do is fix up your machine so it can boot again. If, however, you think the system may be unrecoverable and you want to backup vital information from your whole system to other directories, other hard drives, or removable media you will first need to disable these limitations in Windows itself – so do this now if you want this sort of functionality at the Recovery Console in future:

- 1 Click Start | Run and type in the following: 'secpol.msc'.
- 2 Click down to Local Policies | Security options.
- 3 Scroll down to 'Recovery Console', there should be two options.
- 4 Enable 'Allow floppy copy and access to all drives and all folders'.
- **(5)** Enable 'Allow automatic administrative login' if you want to bypass the administrator password prompt.

When you boot the recovery console next, you'll have full access to the system. Through here you can then use the 'Set' command to allow one of four variables:

Set [variable] = true/false

Where the possible variables include:

allowwildcards: allows the use of '\*' to perform a similar action on multiple files eg. 'del \*.txt'

nocopyprompt: disables the warning that appears when overwriting files.

allowallpaths: gives access to all drives and directories.

allowremovablemedia: enables the use of CD-ROMs, floppies or other removables for backup.

#### Fixing simple problems

The recovery console is handy to help you recover a broken Windows installation, but it isn't a wonder tool.

The console is most helpful in the following circumstances:

#### • Disk corruption

If the file system is seriously damaged, first try and backup all the vital data that you don't want to lose. Then run 'chkdsk/p/r' to repair the disk. The '/p' and '/r' switches respectively tell chkdsk to perform an exhaustive check of a volume and attempt to recover data from any bad sectors on the disk.

Be warned that while it may or may not be effective in restoring file system integrity, chkdsk can sometimes trash data in the process of recovery – hence backup your files first. Those that weren't accessible prior to chkdsk may be accessible afterwards.

#### · Backing up data

You can use the 'diskpart' and 'format'

commands to create and format new partitions on current or newly installed hard drives (handy if you want to install a drive just to copy all your data to it). Additionally you can use the 'net' command to map a drive letter to a network device and backup information this way. Use the 'map' command to show current devices and connections, including file system type for each volume.

Note that you should not use diskpart if you have dynamic disks as it could incorrectly modify your partition table. Dynamic disks are best managed by the Disk Management tool in Windows.

#### • Driver or service instability

If a driver or service is causing a problem, it may be enough to simply disable it and reboot the machine. Use 'listsvc' to list services, and the 'disable' and 'enable' commands to modify their boot time behaviour. Alternatively, if this doesn't help you can try replacing a driver with the original (if available) from your installation CD. For this you can use the 'expand' command to extract the driver from a CAB file:

expand d:\i386\driver.cab /f:[driver filename] c:\windows\system32\drivers

#### • Boot issues

If the boot sector or MBR (Master Boot Record) is damaged you can use the 'fixboot' and 'fixmbr' commands respectively. These are useful if your boot sector or MBR is damaged while repartitioning or installing other operating systems, and especially in the case of viruses which have a habit of trying to modify boot sectors.

If the NT boot loader has also been lost you can easily replace this from the CD, just copy 'ntldr' and 'ntdetect.com' (to be sure) from the 'i386' directory on the CD, like so:

copy d:\i386\ntldr c:\

Aside from these common solutions you can, of course, also use the Recovery Console to replace any damaged files from your own backups.

Keep in mind the Recovery Console is designed to help solve specific problems with services, drivers, and file systems. It's a great tool for getting your system booting again, but rely on Windows-based programs to then properly repair and recover your system.

#### **RECOVERY CONSOLE COMMANDS**

Many of these commands are inherited from DOS with the addition of some specific console-based Windows utilities to aid in system recovery. All of them have various switches you can use, run the command with '/?' to see.

For more detail on each command go straight to the horse's mouth at http://support.microsoft.com/?kbid=314058. Print it out on real, no-foolin' paper and store it somewhere safe because the time that you'll actually need it will be when you can't boot Windows.

#### **Navigation**

attrib change file and folder attributes
cd change directory
cls clear the screen
copy copy files
del delete files
dir list directory contents
md create a new directory

dir list directory contents
md create a new directory
rd remove a directory
ren rename a file or folder
type display the contents of a file
exit exit the Recovery Console
help display command help



For the love of all that is holy, print this out now!

#### Configuration

bootcfg manage the boot configuration of your Windows installation diskpart manage local partitions and drives disable a Windows service or driver enable a Windows service or driver

expand decompress files from Microsoft CAB files listsvc list the state of all services and drivers net map remote shares to local drive letters

#### Storage

chkdsk checks for and corrects filesystem errors

fixboot writes a new Windows boot sector onto the boot partition

fixmbr repairs the Master Boot Record (MBR)

format formats a specified partition

map all local and remote device mappings



# go faster >



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# **UNBLOCKING OUTLOOK**

Outlook blocks certain attachments by default – which isn't particularly polite. **Nirmal Chandrasena** shows you how to unblock those files.

number of devastating attacks on the Internet and private networks have highlighted the vulnerability of many email systems, and their ability to act as highly effective channels for the delivery of malicious code.

Viruses travel either as attachments or embedded scripts within email content, and while some rely on the automation features of an email client, others depend on social engineering. A user might open a seemingly interesting email (or preview it) only to inadvertently execute a piece of malicious script. Alternatively, the user might 'execute' an attachment manually, and load the malicious code that way.

The Microsoft family of email clients, Outlook Express and Outlook, have proven themselves an attractive target for malicious attacks due to their ubiquity and arguably weak security. But while many third-party antivirus packages offer features to scan emails, Microsoft's clients simply block suspicious material altogether.

#### Hackin' the registry

How do the Microsoft clients determine what's malicious or not? Simple – it looks at the file extension, and if it's potentially dangerous, the attachment is blocked. Blocked extensions included executables



# Outlook blocks an attachment and announces the fact.

(.exe; .com) and script files (.vbs; .js).

Understandably, users do not always want this to happen. The only obvious way around the blockade is to compress or rename the file, thereby stopping the 'accidental' misuse of malcode.

Microsoft Outlook relies on an internal list of extensions to determine which files are blocked which are allowed. The types of files that are completely blocked are known as 'Level 1 attachments', and Outlook, annoyingly enough, has no built-in option to adjust these settings. Fortunately, it is possible to enforce exceptions through the registry.

Note the below hack will work for Outlook XP and Outlook 2000, but only if the latter has been patched with the latest Microsoft security update. Also, you will need to have administrative privileges. Also remember that tampering with your registry is risky business, so be sure to back up your files and the registry before entering – we



Move down the registry tree until the required node is located.

can't take responsibility for any lost data.

- 1 Open the Windows registry editor by typing 'regedit' at Run in Start Menu.
- 2 Back up the registry by selecting Export in the File menu, and save a copy.
- (3) Expand the registry tree to thread: HKEY\_CURRENT\_USER\Software\ Microsoft\Office\10.0 (or 9.0 for Office 2000)\Outlook\Security
- 4 Now, in the Edit menu, select New and then String Value.
- **⑤** A new value will appear on the right frame of the editor called 'New Value #1'. Rename this to 'Level1Remove'.
- 6 Double click on 'Level1Remove' and a window will appear. In the Value Data field you can start entering in names. The format is 'extension; extension' ie. 'exe; vbs; mdb'.
- ② Click OK and close the registry editor. Your changes will be saved automatically. Restart Outlook for them to take effect.

You will find that the file types of the extensions you defined in the registry key will now be allowed through. A virus scanner is still recommended. While there's a variety of packages available online, check out this month's cover CD for a full working version of of BitDefender 6.5.

A textbox lets you enter values to the registry key.

Edit String	? <u>[</u> 2
Value name:	
Level1Remove	
Value data:	
exe;vbs;mdb	
	OK Cancel

# RESTRICTING ATTACHMENTS IN OUTLOOK EXPRESS 6

While Outlook is part of the Office suite, Outlook Express (OE) ships with Windows itself. OE inherits many of the security settings defined for Internet Explorer. This means that the way OE reads emails can be adjusted by tweaking the security zone settings found under IE's Tools | Options | Security panel. Most of these settings deal with the automatic execution of scripts or the usage of ActiveX controls. The blocking and unblocking of attachments is done within OE itself, and although the procedure is considerably simpler than configuring it's bigger brother, it isn't as effective.



With just a few quick clicks, Outlook Express allows you to restrict attachments in-house.

- 1 Start Outlook Express and go to the Tools | Options | Security tab.
- 2 Untick the 'Do not allow attachments to be saved or opened that could potentially be a virus' check box.
- 3 Click OK and restart Outlook Express.



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# **MODEM TWEAKS**

## Tim Dean gets your modem running smoothly with these tips.

n these days of gigahertz processors, and gigabytes of RAM, the humble modem seems a little out of place with its 1960s technology, speeds measured in thousands, not billions, of bits per second and the archaic methods of setting them up. Yet the majority of Internet users around Australia still use a modem to connect to the Net, so here we'll look at some ways to make sure you're getting the most from your modem.

First off, even though there are dozens of brands of modems, there are only relatively few manufacturers of the actual modem chipset, and it's the chipset that determines many of the features and the types of commands that can be used. These days, most modems use a Rockwell/Conexant chipset, and even if you install Windows 'Standard 56000 b/s Modem' driver, it should work fine. If you do get problems though, you should determine what chipset your modem is using, and install the manufacturer's driver.

Sites like http://808hi.com/56k/chipset.asp will help you find out which chipset your modem has.

At the end of the day, though, the main thing the modem driver affects is the modem's

### **AT COMMANDS**

Here is a basic list of generic AT commands that should work with most modems. Replace the 'n' with one of the numbers to set that setting.

- &Fn Recall factory profile (0=chipset default; 1=modem default)
- Xn Dial tone/busy signal response (0=wait for dial tone; 3=ignore dial tone)
- &Cn DCD control (0=always on; 1=track state from remote modem)
- &Dn DTR control (0=ignore DTR; 2=hang up modem on DTR switches off)
- &Kn Data flow control (0=disable flow control; 3=enable RTS/CTS flow control)
- %Cn Data compression (0=disable; 1=enable V.42bis/MNP Class 5)
- Zn Hard reset modem to factory default

initialisation string. At their heart, most modems are controlled by simple text commands, known as Hayes AT commands, or just AT commands (see box below). Just before a modem dials a number, these commands are processed to establish all the required settings. You can use AT commands to set the modem's speed, how it handles error correction, or whether or not to use flow control.

While many modems use slightly different commands, or have extras thrown in to control special features, the majority still obey the basics. For example, the command ATZ will reset most modems to factory default settings.

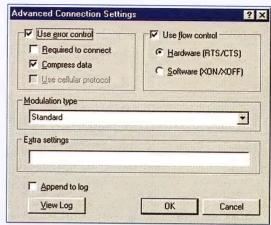
You can manually adjust the initialisation string of your modem and override the default settings with your own. In Windows 9x, go to the Properties of your connection icon in Dial-Up Networking, then click on the Configure button, then the Connection tab, and the Advanced button. You will see a box called Extra settings, and in here you can input your own commands.

In Windows XP, go to your Phone and Modem Options Control Panel, and go to the Properties of your modem. In the Advanced tab there is a box called Extra initialisation commands. For both Windows 9x and XP, you don't need to include the 'AT' at the front of the string, so 'AT&FO' would just be '&FO'.

A good way to start is to set your modem to its factory default with the &F0 command; X3 to tell your modem to ignore a poor carrier tone, such as if you have Message Bank installed on your phone; then set the modem to track its carrier detect status from the remote modem with &C1; and set the way the modem responds to the Data Terminal Ready signal from your computer with &D2; then enable flow control with &K3. You can also experiment with data compression by turning it on with %C1, or off with %C0.

There are many more AT commands at your disposal too. Try your modem manufacturer's Website, or a site like www.modemhelp.org to see some more options.

The next thing to set is the port speed between your PC and your modem. While it might seem to be a good idea to set the port speed to be the maximum allowable, usually



You can enter your own initialisation string in the Extra settings box in the properties of your Dial-Up Networking connection in Windows 9x.

115,200b/s, although this can cause more grief for your modem than good, because your PC will constantly be sending more data than the modem can transmit over the phone line, thus forcing the flow control to keep pausing the flow. The ideal port speed is one setting above the maximum speed of your modem. This means 57,600b/s should be adequate for 56K modems, and 38,400b/s for 33.6K modems.

Also, when you do connect, don't be alarmed if the reported speed is lower than expected. Given the technological and environmental barriers your poor modem has to overcome every time it tries to cram data over our ancient PSTN lines, anything over 33.6K should really be considered a blessing. Even the slightest line noise will reduce a 56K modem to 40K or less. Also, the reported speed can actually change during your modem's session, so it may go up or down without any indication from Windows.

Finally, if you're experiencing dropouts or poor performance, the best thing to do is get steadily more conservative with your settings, by disabling data compression for example, to insure a stable connection. Let's face it, 33.6K is still preferable to a 45K connection that only stays up for two minutes at a time. Also, if you keep getting bumped off because of incoming calls, you can disable Call Waiting by dialling #43# on your phone, and then re-enable it by dialling \*43# when you're off the Net.

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# **JARGON BUSTER: OPERATING SYSTEMS**

**Nirmal Chandrasena** helps you cut through the jargon with our monthly technology glossary.

#### **COMMAND-LINE INTERFACE:**

A command-based interface of an application or operating system. Where a GUI uses graphics, a command-line uses text. A command-line waits for instructions to be entered into a command prompt ranging from general commands such as 'copy' to more advanced actions like searching large groups of files for specific text strings. For certain tasks the command-line is more flexible than a GUI, with many power users preferring the keyboard interface to the mouse.

#### DOS:

Microsoft's Disk Operating System (DOS) is the 16-bit OS predecessor to Windows. DOS uses a command-line, and was one of the first mainstream platforms used for operating personal computers. There are various versions of DOS, and the most popular version is undoubtedly MS-DOS, which was bought by Microsoft in 1981. Though DOS is now largely redundant, current versions of Windows still offer it by means of emulating a command-line environment (know as the 'DOS-prompt').

#### DRIVER:

A driver is a piece of software that allows an operating system to interface with a piece of hardware. A driver often determines how well hardware components perform together, and vendors constantly revise their drivers to keep them up-to-date with new technology. Most operating systems contain a set of default drivers, although it's wise to download the latest drivers from the manufacturer's Website and install them for maximum performance and stability.

#### **EMULATOR:**

An emulator allows you to run software for another operating system on your native OS, for instance, running Windows software in Linux. Emulators work by creating a closed 'container' and then simulating the appropriate hardware conditions for another operating system to run. Emulators are typically used to emulate old or dead hardware (like the Commodore 64) on a different hardware platform or to run an older version of an operating system within a more recent one. VirtualPC and VMWare are common professional emulators and there are

numerous individual projects that allow for almost any computer and operating system to run on a foreign OS.

#### FILE:

A file is the elementary unit of a file system, a method of data organisation used in operating systems. Files are typically identified by a name and format, as denoted by a suffix (eg. .exe; .doc; .bat).

#### FILESYSTEM:

This is used by an operating system to logically organise files in storage space. Examples of file systems are FAT16, FAT32, and NFTS, used by MS-DOS and Windows operating systems.

#### **GUI (GRAPHICAL USER INTERFACE):**

A GUI allows a user to interact with the operating system through icons, menus, and windows as opposed to entering text commands via a keyboard and a command prompt. In addition to a keyboard, a GUI requires a pointing device such as a mouse or trackball. Because of their user-friendly nature, GUIs were instrumental in bringing personal computing to the masses and are essential for tasks like graphics-based applications. MacOS, Microsoft Windows and X Windows are common GUIs used today.

#### **KERNEL:**

The kernel is the nucleus of an operating system dealing primarily with low-level input/output tasks. There are two types of modern kernel design: the microkernel and the monolithic kernel. The microkernel is a modular, easily portable system that only handles I/O tasks, palming other tasks like memory management and resource allocation to other modules. Monolithic kernel design takes the opposite approach by allocating all tasks to the kernel, theoretically making it faster as it doesn't have to 'communicate' with other modules. Mac OS X's 'Darwin' kernel. Windows NT/2000/XP and BeOS are examples of microkernels while Linux, Windows 9X, DOS and the original MacOS are monolithic.

#### LINUX

Specifically, Linux is a kernel designed by Linus Torvalds for the purpose of running a

familiar Unix-like environment on x86 hardware. Linus released the kernel as a freely distributable open source product (under the General Public License), which resulted in rapid development and distribution, particularly in cost conscious corporations and research institutions. The term is now used to describe any operating system based on the Linux kernel. Red Hat, SuSE, Debian and Mandrake are all examples of Linux distributions.

#### **OPERATING SYSTEM:**

At its most basic level, the operating system refers to a tool, or a collection of tools, that interface with and control hardware. There is some controversy over what constitutes an operating system. Some believe that it's the kernel that defines the operating system (like Linux or Windows NT) while others believe that it is the set of tools, for example Unix or Windows XP. In the latter instance Linux could be called GNU/Linux as it uses GNU's free operating system tools (like the GNU compiler and assembler) in conjunction with the Linux kernel.

#### UNIX

Strictly speaking, Unix refers to a multi-user, multitasking operating system developed at AT&T Bell Laboratories for mini-computers and mainframes.

However, it is easier to understand Unix as a collection of operating systems, all originally based on the Unix concept. Many operating systems are based on Unix including MacOSX, BSD, GNU/Linux, Solaris, and IRIX. Currently, Unix and Unix derivatives provide the largest opposition to Microsoft Windows and can run on all forms of computing hardware.

#### WINDOWS:

Microsoft Windows, largely based on Apple's seminal windowed interface, MacOS, is now the most popular operating system. Initially built on top of MS-DOS, Windows hit mainstream computing with Windows 3.1 before moving through later iterations — Windows 95, 98 and Millennium Edition. With Windows 2000 and Windows XP, Microsoft joined the Windows 9x-based operating systems with its more robust and stable server-side operating system, NT.

# LEISURE

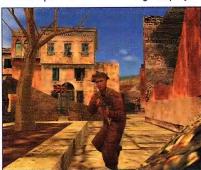
Des McNicholas takes his soccer team, by air, through the battlefields of Europe and ends up at an amusement park.

## DAY OF DEFEAT

his independent Half-Life mod offered a budget trip to Europe long before Medal of Honor and Battlefield: 1942 gave us a five-star ride, gaining a strong online support base along the way. Half-Life developer Valve has since bought the rights and added some refinements and new elements, resulting in a challenging and well-paced title that should see community support continue to grow. Day of Defeat shows its age when compared to the recent crop of similar titles, but this is a solid WWII game with a well-crafted emphasis on close-quarter infantry action. Unsurprisingly, given its origins at the sharp end of the gaming community, Day of Defeat is exceptionally well paced and places the accent on action rather than sitting around waiting to jump back in.

Shipping with fifteen maps from some of WWII's most famous battlefields (including

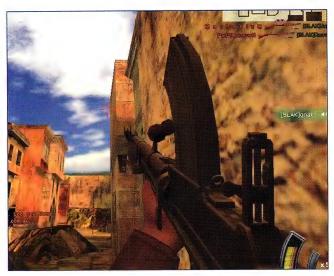
Although it looks a little dated, DoD makes up for it with intense gameplay.



Caen, Anzio, Normandy and Italy), Day of Defeat boasts a diverse mix of locations and some interesting tactical challenges. Valve has added the Brits to the original German versus USA national options along with some new weapons. An online-only game with no single-player training options, Day of Defeat offers just two types of missions, Territorial Control, in which the aim is to seize and control flags; and Capture/Destroy the Objectives, where teams are assigned specific tasks. It doesn't sound like much in the way of game options, but the relentless focus on co-operative team play means that players are generally too busy to notice.

Even though it brings 12 well-balanced character classes across the three nations, Day of Defeat's three weapon categories (rifles, sub-machine guns and machine guns) seem a bit light-on at first. That said, the

weapons are well-modelled with realistic recoil effects, and the bipod-mounted machine guns provide devastating firepower in the right environments. The game set-up and onscreen interfaces are well designed and nicely presented (even handsignal shortcuts are available). The movement and weapon



You just have to love machine guns!

controls will be second nature to anyone with online shooter experience; and sound is exceptionally well implemented.

The environments tend to be close-in, and the general atmosphere is one of impending doom at every turn. The scenery looks very average in places, but Valve has managed to push the aging Half-Life engine about as far as it can go and players will be pleased with the overall effect and the relatively low system requirements. Character animations are nicely done, and the game screen is uncluttered.

Despite being well tested by the online community for a couple of years, Day of Defeat still contains a few minor graphical bugs and the odd network code glitch. Fortunately, the new maps are challenging, with objectives that emphasise teamwork, tactical planning and sensible weapon selection. Communication is well implemented via hotkeys and optional voice support.

The key question for most is whether the packaged product brings enough to warrant the cash when the basic game can be downloaded free. The answer is probably 'yes', but don't expect anything spectacular.

www.dayofdefeat.com

REQUIREMENTS: 450MHz
CPU; 64MB RAM; 735MB hard
disk; and OpenGL or Direct3D
card recommended
SUPPLIER: Activision
PRICE: \$49.95
OVERALL ... 123456

## MICROSOFT FLIGHT SIMULATOR: A CENTURY OF FLIGHT

espite having no guns, bombs, violence or fastpaced excitement, the never-ending Microsoft Flight Simulator series sets outstanding sales figures with every new release. FS 2002 outclassed and essentially destroyed all opposition in the genre, and it was hard to see what Mr Gates could pull out of his hat for the next instalment. The answer, surprisingly, has been to step backwards a hundred years or so and give players the chance to fly some of the 20th century's most famous aircraft. Century of Flight still needs some work, but it already looks as though it's going to be another expensive and non-violent Christmas. Century of Flight will bring

**SUPPLIER:** Microsoft

the usual fine tuning of the proven formula, with improved training, enhanced weather effects and an up-gunned engine, but the availability of historical aircraft and flights adds a terrific new dimension to the game. Historical aircraft include the Wright Brother's original flying machine, the Ford Trimotor and the outstanding de Havilland Comet. Players have the chance to follow in the paths of the world's greatest pilots through pre-planned flights. Newer aircraft are also well covered, with a mix including four varieties of Cessna, the 747-400, Robinson and Bell helicopters and the Schweizer SGS 2-32 sailplane.

Even in beta, Century of Flight flies remarkably well. The improved 3D virtual

cockpits allow players to operate most controls directly. and the autogen dynamic scenery makes the sky a much busier place than it used to be. Ground detail has also been enhanced (Sydney Harbour is now

full of yachts and passenger liners), and the weather effects are almost entirely customisable. The multimedia content has been expanded once again, and the flight planning and analysis options are simply remarkable. Microsoft Flight Simulator:



No need to rush any more!

Century of Flight will be a hit however it turns out - and even though FS veterans can probably access most of the aircraft models through the huge online community it still looks like it could be something special.

www.microsoft.com/games

# **CM4: CHAMPIONSHIP MANAGER**

occer is big - really big and soccer management games have a history of huge sales and remarkable depth. CM4: Championship Manager has already broken UK and European sales records, and a few hours with the game is enough to see why. Players will be finding hidden depths to this title for months to come, as it is clearly the most comprehensive and addictive sports management sim yet seen on the PC. CM4 includes 39 international leagues (including Australia), building on the same basic premise of its predecessors

**REQUIREMENTS: 600MHz** (optimised for P4) CPU; and 64MB RAM [128MB for XP] SUPPLIER: Atari **PRICE:** \$89.95 OVERALL ... 123456 while introducing more layers of realism and a new 2D match view to complement the traditional ticker-tape updates. It all comes at the cost of highend system requirements, but it's worth it for those die-hard number-crunchers.

Team selection and training lies at the heart of CM4, as players take on the role of managing a soccer team towards national and international glory. The job can be very hands-on, running just about everything from recruitment, to training, finances and bringing the oranges on at half-time (OK, maybe not). Players also have the option of relying on the judgement of their support staff, which includes assistant managers, coaches, physiotherapists and scouts. The level of detail is simply

overwhelming, thanks to the sheer number of choices available and the extent of CM4's league database. Throw in stadium redevelopments, sponsorship negotiations and very direct fan feedback; and the late night hours will fly by.

CM4 has a surprisingly accessible interface and a reasonable learning curve. Kicking things off is simple, thanks to a wellstructured walkthrough, but things naturally get tougher as the season progresses.

Eidos has revamped the control system, providing more mouse control and shortcuts, and the new 2D game view is a big step forward. Like most games of this type, there's no middle ground with CM4 -



This is as exciting as Championship Manager gets visually, but a lot happens behind the scenes.

> you get captured by the compulsion to micro-manage and reach the top; or you lose interest after a few seasons. It lacks the immediate excitement we've come to expect from sports titles, but CM4: Championship Manager is unmatched as a sports management sim.

www.championshipmanager.co.uk

### X-MEN 2: WOLVERINE'S REVENGE

■he X-Men saga was a huge hit for Marvel Comics well before the success of the first movie, and lead character Wolverine has been seen on the odd 2D platform game in the past. Even so, X-Men 2: Wolverine's Revenge plays like the blatant movie tie-in that it is, with all the faults you'd expect to see in a game rushed out to coincide with the release of the latest film.

Surprisingly, the plot has very little to do with the movie, as Wolverine battles to find the antidote for a longdormant virus that threatens to kill him in 48 hours.

Despite the decent story and

SUPPLIER: Activision PRICE: \$49.95 OVERALL ... 123456



some good voice acting, X-Men 2 is at its core a very average port of an average console title, and players will be disappointed with the cumbersome control system and the overuse of cut scenes at the expense of hands-on action. Hard-core fans will welcome the obvious links to the comics and the hidden bonuses, but those elements are balanced by the inconsistent enemy AI, superficial objectives and below-par sound effects. Definitely a sheep hiding in wolverine's clothing.

www.activision.com

## **COLIN MCRAE RALLY 3**

his is another series that just gets better with every release. Fresh from its recent console success, Colin McRae Rally 3 shows that ports to the PC can be successfully implemented if developers just take the time to balance the demands and capabilities of the system. Codemasters has done just that, resulting in an unmatched rally experience that looks and sounds terrific. Cardboard spectators aside, Colin McCrae Rally 3 combines outstanding scenery with tough courses, first-rate driving models and spectacular environmental effects, to deliver a game that will satisfy players on just about every level.

SUPPLIER: Atari PRICE: \$89.95 OVERALL ... 123456



The mix of tracks, teams and cars is excellent, and the game poses some very tough challenges at the higher difficulty settings. Players can choose to race any car on any track right from the start, and the keyboard control system works well enough to dispense with the need for a separate controller. The range of configuration options is probably less than we've seen on some other recent releases, but this one is all about the driving experience. Colin McRae Rally 3 isn't perfect, but it's near enough.

www.atari.com

#### TROPICO 2: PIRATE COVE

espite being a fairly average strategy title in many ways, the original Tropico pulled away from the pack with a unique setting, catchy music and a strong sense of humour. The sequel has been a while coming, and developer Frog City has clearly taken a bit of a chance with Pirate Cove by changing the focus from Latin American dictators to pirates, slaves and exploring the ocean waves. Many of the original games elements can still be seen, but things just don't seem to fit together quite as well as they did last time around.

Pirate Cove's interface is very nicely designed, and Frog City

**SUPPLIER:** Take2 Interactive PRICE: \$69.95 OVERALL ... 123456



has spiced things up with a basic campaign option to supplement the single missions and sandbox mode. Players take the role of a pirate king, balancing the happiness of their pirate band with the misery of their captives and a rudimentary economy. The humour lacks freshness and seems a little out of place, but the music and key gameplay elements should satisfy fans of the original. Tropico 2: Pirate Cove is a solid title, but one that's unlikely to match its predecessor's success.

www.take2games.com

#### RC TYCOON 2: WACKY WORLDS

he Roller Coaster Tycoon series falls squarely into the love it or hate it category, and the hordes that love it just don't seem to be put off by the average graphics, endlessly repetitive gameplay and basic formula. Wacky Worlds flies those same flags once again, although fans will be pleased to see the extra rides, famous landmark locations and new scenarios. The decision not to include the long-awaited sandbox option is a surprise, as the developer seems to have missed an opportunity to reinvigorate a franchise that's coming under increasing pressure from a new generation of strategy titles.

SUPPLIER: Atari PRICE: \$29.95 OVERALL ... 123456



Wacky Worlds is at least as addictive as its predecessors, with the chance to visit places like the Grand Canyon, the Great Wall of China and a lost Incan city adding some spice, and the introduction of some regionalspecific limitations on park expansion adds a few new challenges to the mix. Roller Coaster Tycoon 2: Wacky Worlds Expansion Pack will do well and bring some short-term family fun, but this is a franchise in need of some new ideas.

www.atari.com

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### **HUMOUR (FROM DENMARK)**

he following is a question on a physics exam at the University of Copenhagen: Describe how to determine the height of a skyscraper with a harometer'

One student replied: 'You tie a long piece of string to the neck of the barometer, then lower the barometer from the roof of the skyscraper to the ground. The length of the string plus the length of the barometer will equal the height of the building."

This highly original answer so incensed the examiner that he failed the student who immediately appealed on the grounds that his answer was indisputably correct. The university appointed an independent arbiter to decide the case.

The arbiter ruled that the answer was indeed correct, but did not display any noticeable knowledge of physics. It was decided to call the student in and allow him six minutes in which to provide a verbal answer which showed at least a minimal familiarity with the basic principles of physics.

For five minutes the student sat in silence, forehead creased in thought. The arbiter reminded him that time was running out,

to which the student replied that he had several extremely relevant answers, but couldn't make up his mind which to use.

On being advised to hurry up the student replied:

First, you could take the barometer up to the roof of the skyscraper, drop it over the edge, and measure the time it takes to reach the ground. The height of the building can then be worked out from this formula I have worked out for you on my text paper here.' Then the student added, 'But, Sir, I wouldn't recommend it. Bad luck on the barometer.'

'Another alternative', offered the student, 'is this: If the sun is shining you could measure the height of the barometer, then set it on-end and measure the length of its shadow. Then you measure the length of the skyscraper's shadow, and thereafter it is a simple matter of proportional geometry to work out the height of the skyscraper. On the paper is the formula for that as well.'

'But, Sir, if you wanted to be highly scientific about it, you could tie a short piece

of string

to the barometer and swing it like a pendulum, first at

ground level and then on the roof of the skyscraper. The

height is worked out by the difference in a gravitational formula, which I have determined here by this very long and rather complicated calculation.

Or, Sir, here's another way, and not a bad one at all. If the skyscraper has an outside emergency staircase, it would be easier to walk up it and mark off the height of the skyscraper in barometer lengths, then add them up.'

But if you merely wanted to be very boring and very orthodox about the answer you seem to seek, of course, you could use the barometer to measure the air pressure on the roof, and on the ground, and then convert the

> difference in millibars into feet to give the height of the building.

But since we are constantly being exhorted to exercise independence of mind and apply scientific methods, undoubtedly the best way would be to knock on the janitor's door and say to him "If you would like a nice new barometer, I will give you this one if you tell me the height of this skyscraper".'

The student was Niels Bohr, a Dane who received the Nobel Prize in physics for his work on atomic structure.

#### REPLY

indeed study at the University of Copenhagen, but there are no records anywhere of this having happened to him.

Dr Alex Calandra who also featured the story in his 1961 textbook. Neither of these versions include Neils Bohr,

#### **GOD BLESS THE INTERNET**

#### [NAME UNKNOWN]

As none of us can read Japanese, we have no idea what this site is called. What we do know is it's full of diagrams to build your own cut-out origami robots, and there is no way that can be a bad thing.

www.robo-t.com/ r-kata.html

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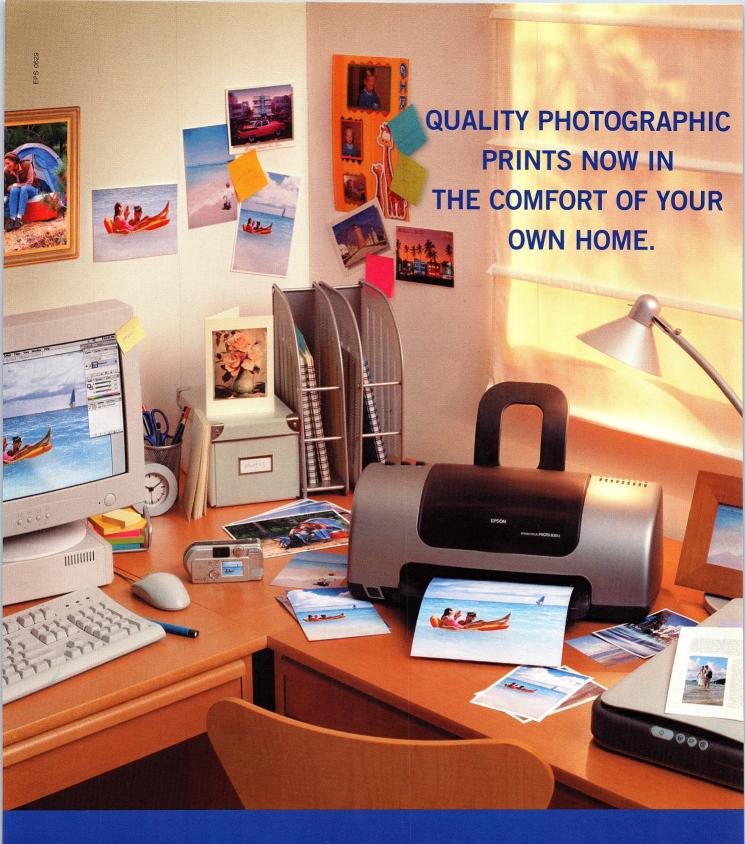
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